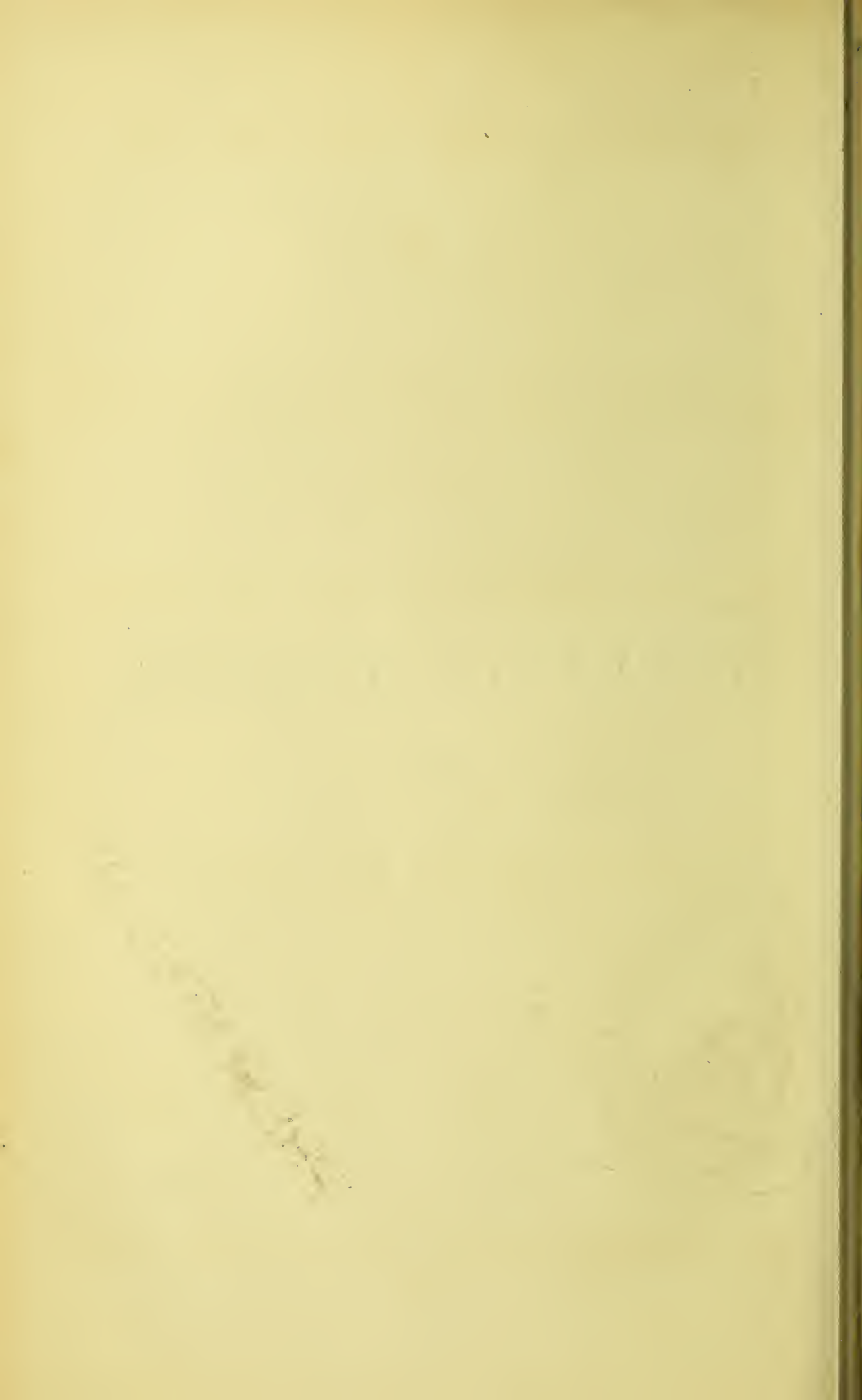


4

NOTES ON HEALTH,
ETC.



4

NOTES ON HEALTH

IN

CALCUTTA AND BRITISH EMIGRANT SHIPS,

INCLUDING VENTILATION, DIET, AND DISEASE.

BY

W. H. PEARSE, M.D. EDIN.,

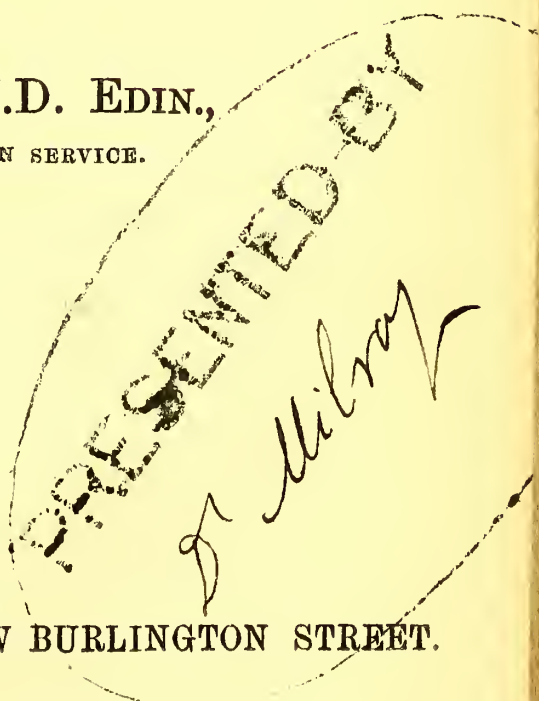
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PREFACE.

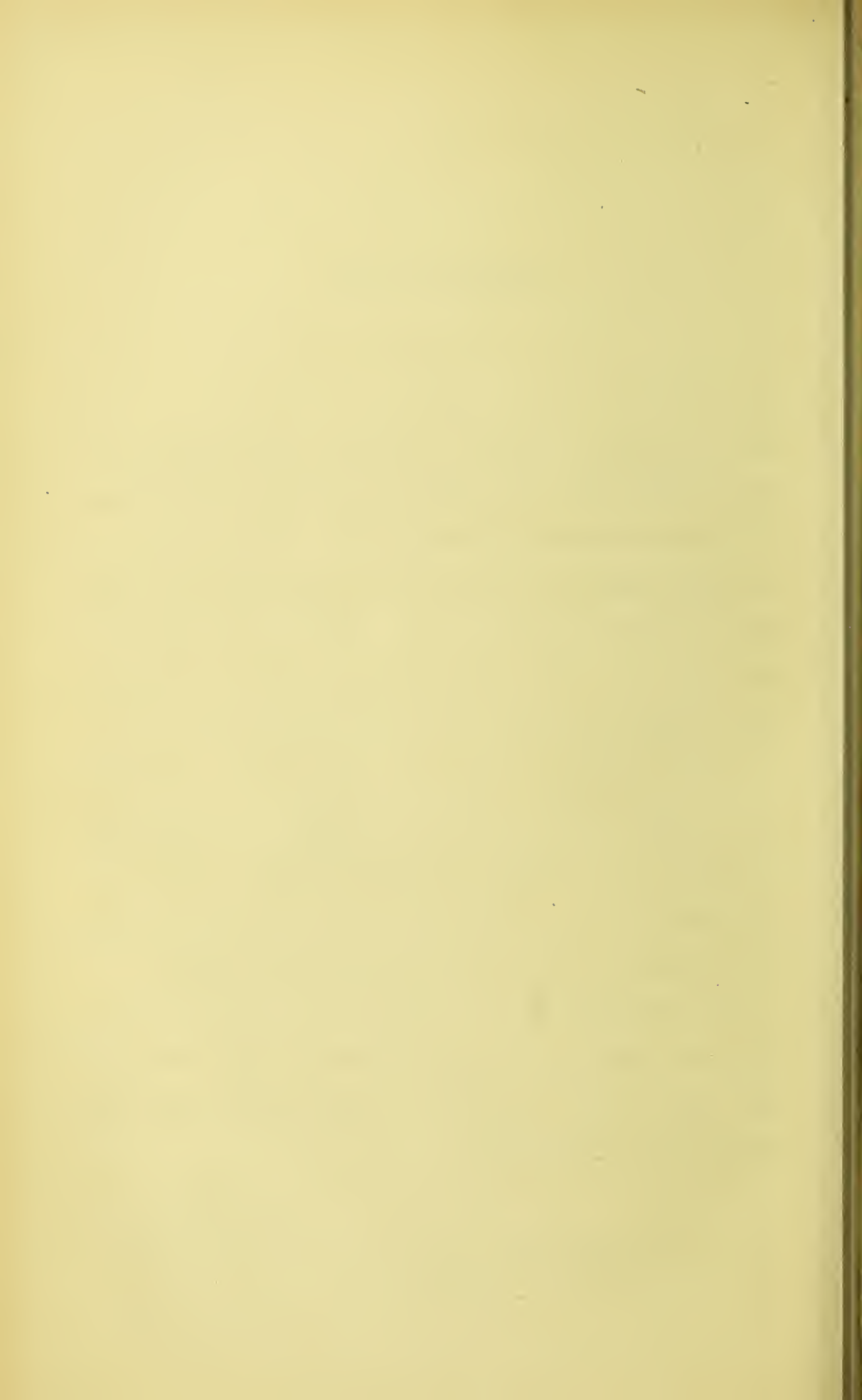
THE following "Notes" embrace some points of great importance in reference to the Ventilation, Diet, and Health of Emigrants. They are professedly imperfect, and are put forward not only with a view of giving some information, but in the hope that, by calling attention to the subject, others may contribute from their experience.

Very insufficient discussion has taken place on the management, health, and diseases of emigrants. Without practical knowledge, or great caution in judgment, we are liable to reason very erroneously on all matters concerned with ship-board life.

The descriptions of "Disease" in the various ships are true as to fact; however wide from, or near to, a right "method," may be the aspect in which I have placed them.

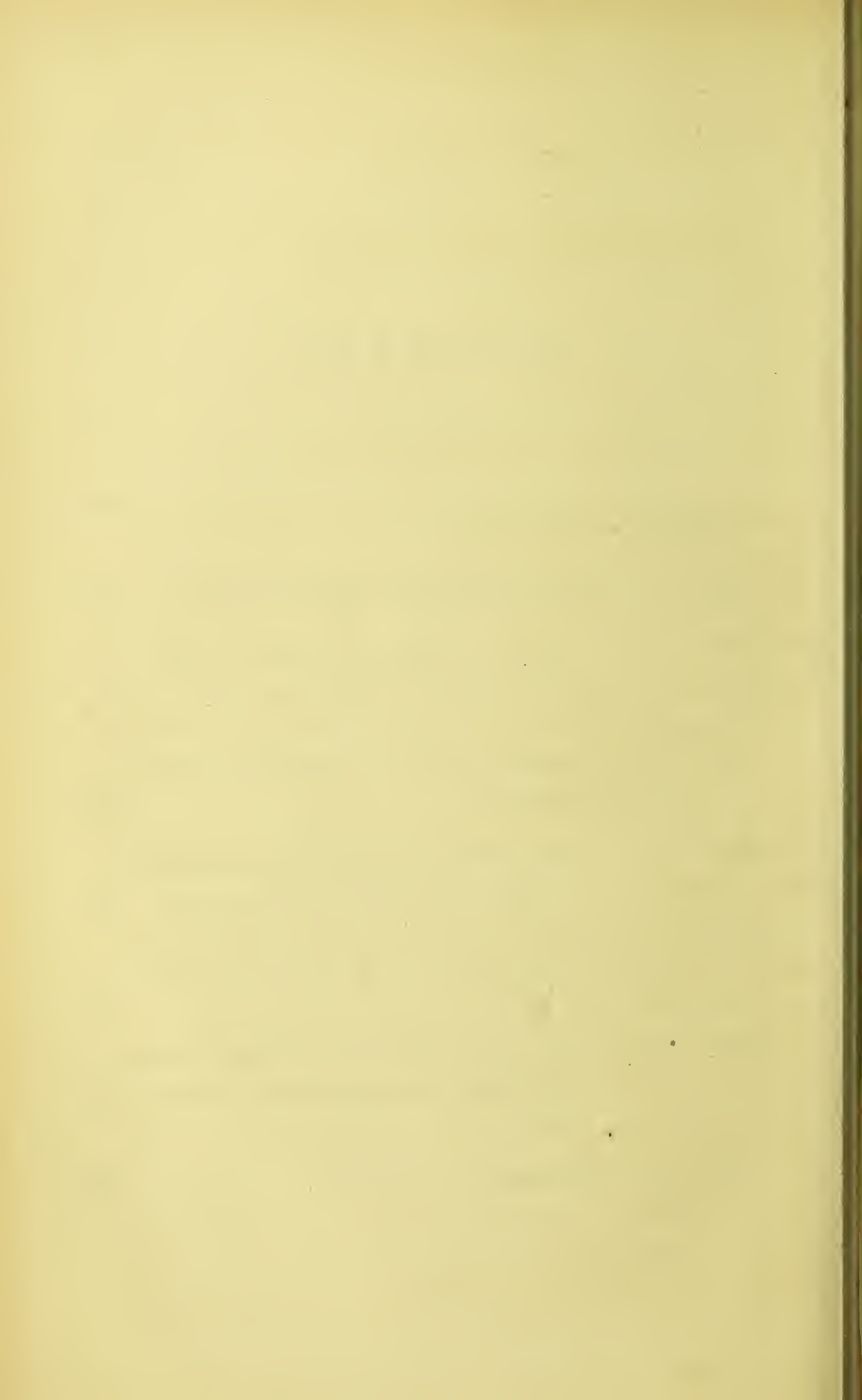
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NOTES ON HEALTH,

ETC.

I.—VENTILATION.

THE following Notes refer to emigrant ships sailing from England to Australia, or from Calcutta to the West Indies. The general character of these ships is, that the whole 'tween decks, from one end to the other, may be regarded as a clear space. In the Calcutta ships this is actually so. In the English emigrant ships the bulk-heads are of louvering work, and are only two in number, so that the whole space of the 'tween decks is practically one great room.

In this room are placed 1 statute adult per 15 superficial feet in English emigrant ships, and 1 statute adult per 10 superficial feet in Calcutta emigrant ships. The ordinary means of ventilation in emigrant ships are three or four hatchways; to which are added one considerable opening at the after end; one also at the fore end; and further, four tubes of about 1 foot 4 inches diameter, one at each entrance corner of the 'tween decks. These tubes, which rise above the bulwarks, are fitted at

their tops with moveable cowl-heads, which can be turned in any direction.

I shall endeavour to show, that by attention to the proper adaptation of these simple means, a sufficient ventilation can be obtained; that the true and simple principles on which ventilation depends can be maintained by such arrangements; and that many of the useless, expensive, and pernicious patents which are attempted to be given to emigrant ships, can be best done without.

I have stated that any remarks made in these notes on ventilation, refer to Australian and Calcutta emigrant ships, with clear 'tween decks and free hatchways, and not to ships engaged in particular services, where hatches must be shut, or where additional crowding exists, or where small vessels are engaged in tropical river services, &c. Practically, and as a very general rule, emigrant ships are placed under two kinds of circumstances, viz., under way, or sailing from one to ten knots, or about an average of five; and in calms.

They also, in every voyage, sail through a tropical and cold or temperate climate.

The system of ventilation adopted has to meet all these different conditions.

During any period that a ship happens to be becalmed the 'tween decks becomes intensely oppressive. Calms are mostly in the tropics near the equator, and occur often with heavy rains. When becalmed in the tropics, without rain, the ther-

mometer below often ranges from 86° to 90° . At the equatorial rain belt, during the cooler rains, the heat is less intense, the thermometer falling three or four degrees below 86° or 90° .

The ventilation is slow in the 'tween decks (under these circumstances); the body bursts out in perspiration, and is painfully oppressed. One longs for some means of making a more rapid change of air. But no doubt here a vast ventilation is going on: the open hatches allow the heated lighter foul air to escape, while the cool pure air gravitates below; and however uncomfortable these days are, I shall show instances which point that such a close condition of the 'tween decks is not so hurtful as it has been commonly thought to be; and, indeed, on more than one occasion, the most healthy periods of the voyage, have been those of the hot, damp, calm latitudes.

These conditions of calms in an Australian voyage, or during the voyage from Calcutta to the West Indies, last on an average from four to ten days; sometimes, but rarely, more.

I do not remember to have ever noticed that any form of disease on shipboard, either with English or East Indian emigrants, showed an increase in number or intensity during the sultry weather of the calm equatorial belt.

But even supposing this maintained standard of health under calms to be a general truth, yet the condition of the 'tween decks in such weather is

most oppressive, and could any rational and practical means be found of changing the 'tween-deck air a great comfort and boon would be conferred on emigrants.

The other state in which a ship is placed at sea is one of motion. The ship as a whole, the 'tween decks as one great apartment, is being moved through the atmosphere, at rates, varying from one to ten miles an hour.

If the 'tween decks, this great room, were a space closed at each side, also below and above, but open at each end, it is plain that the ship, passing through the air, must experience the most complete ventilation in the 'tween decks; and in reality this illustration is but an exaggerated description of what an emigrant ship's 'tween deck is. Large openings in the upper deck exist, at the extreme ends of the room, others at intervals in its whole length, so that with the ship's motion through the water and atmosphere, we have a necessary and continuous change of the air of the 'tween decks. Indeed so great is this current or movement of the whole body of the air in the 'tween decks, that means of regulating and often of diminishing it, according to whatever order or rule the change may occur, are more necessary than means of increase.

I shall endeavour to show in part, and under most circumstances, what is the rule and direction of this movement of the 'tween deck air.

Theoretically, the determination of the rate or order of change of the air in a ship's 'tween decks is a difficult problem. It may be thus stated:— Give the air of a large room (the 'tween decks) somewhat freely open to the atmosphere, being moved at the rate of, say, eight miles in the hour, subject also to the influence of the wind, which may be travelling thirty miles an hour in the same direction, in an almost opposite one to that of the general forward movement of the ship.

There follow here some practical illustrations of facts on this subject without attempting to deal with the whole question.

In addition to these parts of the inquiry, viz., the ship's and wind's motion, there is the other, equally important, viz., that with a human cargo, the temperature of the 'tween-deck air is many degrees higher than that of the breeze, often as much as eight. Such a difference of temperature gives a tremendous force to the gravitation of the cool pure air, and upward escape of warm foul.

The general rule, and some such must exist, by which, under the two leading conditions named, the 'tween-deck atmosphere moves and is changed, may be considered a proper basis of a system of ventilation.

The following examples, although they may not thoroughly make clear (in all the very varied circumstances in which the ship may be placed) such a rule, yet point to a very prevailing order.

TABLE A.—*Ship ACCRINGTON, 1900 Tons.—Southampton to Melbourne. 1862.*

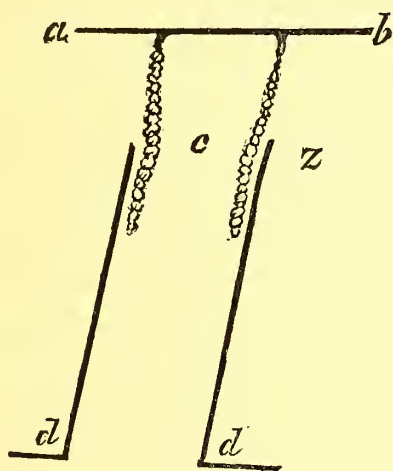
Number.	Place.	Date.	Hour.	Temperature in 'Tween Decks.			NOTES.
				After.	Main-mast.	Forward.	
1	22° S.	-	-	70°	-	74°	{ Close hauled, port tack. The warm foul air plainly felt pouring up the fore weather skylight.
2	28° S.	-	7 a.m.	66°	69°	72°	
3	40° S.	July 22	7 a.m.	50°	53°	57°	{ Close hauled; hatches and skylights almost shut.
4	40° S.	„ 27	7 a.m.	58°	-	66°	
5	-	„ 30	10 a.m.	68°	67°	58°	{ Heavy wind, right aft; running.
6	44° S.	Aug. 10	10 p.m.	64°	63°	54°	
7	44° S.	„ 18	10 p.m.	55½°	60°	63°	{ Close hauled; all hatches, &c., very nearly closed.
8	- {	„ 19	10 p.m.	56°	-	63°	
		„ 20	7 a.m.	63°	-	57°	Square yards; running.

The rule in these instances appears clear and striking. For example, in No. 8 the difference between 10 P.M. on the 19th and 7 A.M. on the 20th, at which two times of observation the hatch openings were the same, proves that the whole body of air in the 'tween decks was commanded by the direction of the breeze above, and that it tended to escape upwards *en masse*, at one or the other *end* of the ship. The circumstances of this ship on the night in question were such that her hatches, &c., being almost wholly closed, reduces the experiment to its most simple conditions; no intermediate draughts having existed to interfere with the natural course of the 'tween-deck air.

The after and fore hatches on this night (as well as on others in the Table) were closed to the same amount as were the several intermediate skylights and hatches.

Another instance is added here to show, under other circumstances, the tendency of the warm 'tween-deck air to escape to windward, or in a somewhat opposite direction to that of the breeze.

In the ship *Alnwick Castle*, of 1100 tons, laden with rice, November 10th, 1862, Bay of Bengal; yards braced up; the forward hold steam-pipe (*d*) had its cover off; no steam escaped up it; when the cover (*a b c*) was fitted on, an immense up-pouring of heated air followed.



The draught out of the foresail, in the first instance, blew with greater force down the pipe than was the tendency of escape. When this was prevented the natural escape ensued, and in an opposite direction to that of the breeze.

One cannot doubt the subordination of the 'tween-

deck air to the upper breeze; but the rule, as indicated (Table A.) is not always so clear. Many exceptions will be observed where the 'tween decks will be found coolest at that end which first receives the breeze. I shall give a few observations of this, offering at the same time an explanation of such apparent exceptions, which may perhaps even afford confirmation of the rule they at first sight appear to upset.

TABLE B.—*Ship* TARQUIN.—*Plymouth to Adelaide.* 1864.

Number.	Place.	Date.	Hour.	Temperatures in 'Tween Decks.			Direction of Wind.*	Lowest Night Tem. on Deck.	NOTES.
				After.	Main Mast.	Forward.			
10	9° N.	Sep. 11	10 p.m.	87	—	83	f ¹	80½	Stern ports partly shut. Stern ports open.
11	7° N.	„ 16		83	—	78½	f ¹	76	
12	6° N.	„ 17	10 p.m.	84	—	82	f ¹	73½	
13	4° N.	„ 19	10 p.m.	83½	—	83	f ¹	72½	
14	7° N.	„ 15	10 p.m.	87½	—	81	Calm	75	
			10 p.m.						
15	8° N.	„ 14	10 p.m.	87½	—	85	Calm	78	

The instances from 10 to 13 inclusive are, I think, explained by 14 and 15, where, during calms, the after part of the ship was hottest.

* The direction of the breeze relatively to the ship will be given as follows:—Wind right aft to abeam as equal to 4 points; a, right aft; a¹, a², a³, a⁴, ab, as between aft and abeam; thus, a¹ is wind a little on the quarter; a⁴, is wind a little abaft the beam; f¹ is wind one point forward of abeam; f³ is close hauled.

During a calm no rule of ventilation can show itself; the ship is hot or cool according to the amount of space given to the hatch and skylight openings. In instances 10 to 13 the action of the rule shown in Table A. was hidden by the greater heat of the after end of this particular ship, as seen in examples 14 and 15, when it was calm.

In the ship *Oasis*, coming down the Bay of Bengal, September, 1865, against the stormy south-west monsoon, where the yards were always braced up, nine consecutive observations give the opposite result to the rule I have suggested, as that which should be the principle of ventilation.

TABLE C.—*Ship OASIS.—Calcutta to Demerara.*
1865.

Number.	Place.	Date.	Hour.	Temperatures between Decks.			Direction of Wind.	NOTES.
				After.	Main- mast.	For- ward.		
16	18° N.	Sep. 8	7 a.m.	88 $\frac{1}{4}$	86 $\frac{1}{2}$	87	f 1	Tweendecks wholly empty of Coolies. First day of awn- ing being spread over the fore- hatchway: thus to-day the cooler eddy wind out of the foresail did not blow down the fore-hatch- way into the 'tween decks.
17	-	" 9	7 a.m.	87 $\frac{1}{4}$	85	85 $\frac{1}{2}$	f 1	
18	-	" 10	7 a.m.	86 $\frac{1}{4}$	86	85	f 3	
19	-	" 11	7 a.m.	87 $\frac{1}{4}$	87	86	f 3	
20	-	" 12	7 a.m.	87	86	86 $\frac{1}{2}$	f 3	
21	-	" 11	Noon.	87	86	86 $\frac{1}{2}$	f 3	
22	-	" 12	Noon.	87	86 $\frac{1}{2}$	87	f 3	
23	-	" 14	Noon.	91	83 $\frac{3}{4}$	89	Calm.	
24	-	" 15	8 p.m.	91 $\frac{1}{4}$	87 $\frac{1}{2}$	86	Calm.	

These nine observations might cast doubt on the oneness of the order of the atmospheric changes under question, did they not receive explanation from two sources. No. 22 was the first day that an awning had been spread over the fore-hatch, thus preventing the driving down, through the fore-hatchway into the 'tween decks, the vast eddy out of the foresail. This excess of colder air being excluded, the fore and after ends of the 'tween decks became, for the first time, equal in temperature, viz., 87° . Observations 23 and 24 still more show that the after end of this ship was naturally (from whatever causes) the hottest; these two instances of calms giving a higher rate of temperature to the after end of the ship, in one instance of 2° and in the other of $5\frac{1}{4}^{\circ}$.

Table D. is an abstract of all the observations taken on board the emigrant ship *Tarquin*.

Thus it is seen that in Class I. wind more or less aft, out of twenty-nine observations, one exception only to the rule occurred. The earlier observations in this Table show but a small difference of temperature between the two ends of the ship. The later reach 13° , 11° , and 7° , &c. The earlier were taken in the tropics, where all the hatches, &c., were open to the fullest; the others off the Cape, in cold weather, where the deck openings were much closed. The conditions here, as in No. 8, Table A., being reduced to the

most simple state from the absence of currents and escapes.

TABLE D.—*Table of all Observations taken in Ship TARQUIN, of 700 Tons.—Plymouth to Adelaide. 1864.*

CLASS I.		CLASS II.		CLASS III.	
Wind aft.		Wind abeam.		Wind forward.	
Warmest aft in the 'tweendecks by	Warmest forward in the 'tweendecks.	Warmest aft.	Warmest forward.	Warmest aft.	Warmest forward.
2°. 1. 2. 5. 2½. ½. ½. 1½. ½. 1. 1½. 2. 2½. 3. ½. 7½. 3. 6. 2. 5. 5½. 13. 11. 10½. 3. 8½. 7. 7.	1°.	1°. 1. ¾. ¼. 0. 1. 3. 6. 3.	Nil.	0°. 3. 4. 6½. 5½. 2. ½. 1. 2½. ½. 3. 3. 3. 2. 1. 2½. 2. 1. 3. 1½. 2½. 5½.	3°. 1. 2. ⅓. ⅓. 1½. 2½. 3. 2.
29 Observations.		9 Observations.		31 Observations.	
28 warmest aft.	1 warmest forward.	9 warmest aft.	—	21 warmest aft.	9 warmest forward.

The exception is a doubtful one. The observations were all taken at 10 P.M. I find my note-book states in this instance, that (calculating the points from due abeam to due aft as eight) the wind was one point abaft the beam. One might readily mistake a point or two in the wind's direction in the night. But allowing this exception to stand, there is, in Class I. of the Table D., proof enough

that when the wind is aft the tendency of the air of the 'tween decks is to pass *en masse* in the opposite direction to that of the breeze; and, being heated, to escape upwards, if means, such as lee-ward-turned cowls or chimneys, be provided.

The rush downwards of the cold air at the opposite end of the ship will be tremendous. I write this from hundreds of observations. *Each end* of the ship has, therefore, to be provided with means of escape, and also means of protecting the people.

I do not feel much confidence in the observations of Class II., Table D., wind abeam. It is often difficult to say, precisely enough for drawing conclusions, whether the wind be abeam, or somewhat forward or abaft.

Under Class III. are thirty-one observations, of which twenty-one are apparent exceptions to the rule, nine in unison with it, and one in which the temperature was equal at both ends.

In many instances, which I have given, the rule appears clearly a true one; and the more so, inasmuch as the 'tween-deck air does, in such, pass *opposite* to, and not with, the commanding (in part at least) influence or force of the breeze, that here, with twenty-one exceptions out of thirty-one observations, some explanation must be found, or the rule cannot be constant; unless, indeed, the explanation of these exceptions is contained in minor circumstances, such as draughts of sails, disproportionate amounts* of deck openings at the different

ends, &c.; and some modification of the system of ventilation suggested might be called for. Under any circumstances these exceptions cannot be overlooked, and means of escape must be provided where it naturally tends.

As the subject of ship ventilation is important, and as we have been taught that "exceptional instances" are always of the most full instruction, I append at page 14 a fuller Table of Class III., with my notes taken, day by day, on the voyage. Table D. contains every observation made throughout the voyage of the ship *Tarquin*.

The average difference of the temperature of all the observations between the two ends of the ship, was 4° hottest aft with the wind aft; and $2\frac{1}{2}^{\circ}$ hottest (in the cases cited) forward when the wind was forward.

The after end of this ship was much the hottest. The hatch at this part was almost wholly shut at 8 P.M.; that forward was wide open. The amount of air which finds its way below at any part reduces much the temperature of that part. The very great difference of temperature, amounting to 11° and 13° at the after end in some cases, when the wind was aft, may be partly explained by the relatively small deck openings at the after end of the ship.

May it not be fairly suggested that (if I may so express it) the temperature aft in this ship being thus naturally higher than it was forward, the

TABLE E., or Class III. of Table D. enlarged.

Date.	Place.	Hour.	Temperature below.			Wind.	Lowest Night Temperature on Deck.	Notes made day by day.
			After.	Main-mast.	Foreward.			
1864. Sept. 9	12° N.	10 p.m.	87°		84°	f ¹	80°	} All hatches, &c., open to the utmost. In this ship, those forward are much greater than those in the after end of the ship. Stern ports partly shut. Calm, and wind all around the compass.
11	...	...	87		83	f ¹	80½
15	7° N.	...	87½		81	f ¹	75	
16	83		78	f ¹	76	All hatches open. Windsail used forward.
17	6° N.	...	84		82	f ¹	73½	
18	5° N.	...	83		82½	f ¹	73	
19	4° N.	...	83½		83	f ¹	72½	Do. do. do. Very small difference. All hatches open. Windsail used forward.
23	15° W.	...	80½		80	f ¹	72	
Oct. 1	Eqtr.	...	81½		80½	f ¹	71½	
2	16° S.	...	84½		82½	f ¹	71½	Do. do. do. All hatches open. Windsail used forward.
3	...	...	81½		81	f ¹	71
*11	30° S.	...	70		67	f ¹	60	
12	23° W.	...	70½		67	f ¹	58	Do. do. do. Very small difference. All hatches open. Windsail used forward.
13	...	...	70		67	f ¹	55
14	...	...	72		68	f ¹	55
19	39° S.	...	64		63	f ¹	56	Hatches variously closed. Windsail used forward. No Windsail used.
20	3° W.	...	63½		61	f ¹	54	
22	40° S.	...	61		59½	f ¹	50	
Nov. 2	61		58	f ¹	54	...
25	38° S.	...	67		66	f ¹	56	
27	...	...	67½		65	f ¹	56
30	69½		64	f ¹	58	...

* In this (Oct. 11) and all the following, the after end of the ship, at the time of observation, had its hatchways &c. much more closed than had the fore and

operation of the rule may yet have existed, though not sufficiently strong to counteract the additional obstacles which a greatly less communication aft, with the upper air, through deck openings, than existed forward?

To show the influence of a lessened supply of air in raising the temperature, I take out of Table E. the following:—

Date.	Place.	Hour.	Temp. below.			Wind.	L. N. Temp.	NOTES.
			After.	Main- mast.	For- ward.			
Sep. 15.	7° N.	10 p.m.	87½		81	f 1	75	Stern ports partly shut; calm; and wind all around the compass.

In this instance, where there is the great difference of $6\frac{1}{2}^{\circ}$, the wind was at times forward of abeam, at others all around the compass and calm, whilst the stern ports were partly shut. This was the exceptional instance of greatest difference. It receives explanation from the greatly reduced amount of atmospheric circulation, at the after end of the ship, from shutting out air; or which is the same thing, the temperature forward was so much lower (one may venture to say, in spite of its natural tendency to be higher) from the vastly greater exposure to the upper and cooler atmosphere.

The following Table shows the difference between

the lowest night temperatures of the upper air and that of the emigrants' deck :—

TABLE F.

Date	Oct. 19	20	23	25	30	Nov. 6	7	8	9	10	11	12
L. N. Temp. Upper Deck.	56°	54°	49°	53°	59½°	47°	56°	56°	52½°	52°	56½°	54°
L. N. Temp. Emigrants' Deck	64°	58°	58°	59°	64°	55½°	65°	65°	58°	54½°	62°	62°
Place.....	39° S.		40° S.			42° S.						St. Pauls.

The average difference of lowest night temperature here between the deck and below, is that the former is 7° lower than the latter. Where an air so much cooler is admitted at one end of a room, in a vastly greater amount, than at the other, the ordinary course of the currents and ventilation of the room must be changed and modified. And here again are reasons for means of escape and protection at the *two ends* of an emigrant ship.

In the last eleven observations of these exceptional instances, Table E. being in south and cold latitudes, the stern ports were always shut, in addition to the after hatch openings being (as already observed) so much more closed than those forward.

As giving the temperature and ventilation of an emigrant ship, I append a Table of the temperatures in the Calcutta Coolie emigrant ship *Oasis*, from November the 3rd, 30° south latitude, 40°

east longitude; to December the 14th, 4° north latitude, 50° west longitude. Table G., page 18.

The direction of the wind relatively to the ship is given, as in other Tables; the cowl-heads were always turned to leeward.

As exceptions to the rule, and illustrating the influence of sails, &c., on the ventilation and temperature, are the examples marked as notes §§, |||, ***, Table G.

In these observations the main-hatch was wide open, and the main-sail being hauled up, no downward draught happened out of it. The escape of foul hot air took place at the main-hatchway, there being a great current down the fully opened after-hatchway out of the mizen-topsail.

It is probable also that the large open space of the main-hatchway, admitting the sun's heat more at that part of the ship than at any other, produced a comparative rarity of air there; but instances of escape occurring at other parts, than *the ends* of a ship are very rare.

The ship *Oasis* was of iron. It is not easy to take reliable comparative temperatures of the different parts of the 'tween decks in an iron ship. The position and exposure of the different parts of the ship's sides to the sun vary much, and influence thermometers suspended in the 'tween decks.

In conclusion, I think that the positive instances quoted of what I have called the rule of 'tween-

TABLE G.—*Ship OASIS.* 1865.

Date.	Place.	Temp. below, 7 A.M.			Cowl- heads Lee- ward.	Temp. below, Noon.			Cowl- heads Lee- ward.	Temp. below, 8 P.M.			Wind.	Cowl- heads Lee- ward.
		Aft.	Main- mast.	For- ward.		Aft.	Main- mast.	For- ward.		Aft.	Main- mast.	For- ward.		
Nov. 3	30° S.	76	75	77	...	78	75½	78	—	80	75	79	f ¹	...
" 4		74	71	74	...	69	66	70	L.	71	69	72	f ²	L.*
" 5		69	68	71	...	69	66	71	L.	72½	...	71	f ²	L.
" 6		75	72	75	...	76	74	76	L.	79	...	77½	O	L.
" 7		74	72	75	...	76	...	75	L.	75	72	77	f ²	L.†
" 8	Off Cape	71	71	73	...	70	...	72	L.	69	67	71	f ³	L.
" 9		67	65	66	...	66	64	69	L.	67	67	69	f ³	L.
" 10		67	69	70	...	67	66	68	L.	69	67	69	a ²	L.
" 11		68½	66	69	...	71	69	67	L.	69	67	67	a ²	L.
" 12	Table Bay.	69	66	66	...	73	72	70	L.	74	70	73	anchor	L.
" 13		68	65	68	...	...	...	...	...	73	70	67	a ²	L.
" 14		68	66	68	...	69	...	67	...	67	63	66	f ³	L.
" 15		67	62	65	...	68	64	66	L.	65	68†	66	a ²	L.
" 16		67	67	64	...	69	70	67	L.	71	70	72	a	L.
" 17		71	71	67	...	...	...	...	...	73	...	71	a ²	L.
" 18	28° S. 5° W.	72	70	69	...	72	68	70	L.	71	69	73	a	L.
" 19		70	67	70	...	70	70	70	L.	71	...	69	a	L.
" 20	24° S. 0° Long. Tropic.	69	70	67	...	...	...	...	...	74	73	72§	a	L.
" 21		70	...	69	...	72	72	71	L.	74	73	71||	a	L.
" 22		...	...	...	...	72	72	73	...	...	...	...	...	...
" 23		73	71	72	...	74	71	74	L.	73	74	73	a ¹	L.
" 24		74	71	72	...	75	71	75	L.	76	75	73	a	L.
" 25	19° S. 8° W.	75	71	73	...	75	72**	75	L.	75	75	75††	a b	L.
" 26		...	...	...	...	76	71	73	L.	78½††	76½	80½	a ²	L.
" 27		76	72	72	...	77	73	73	L.	...	...	...	...	...
" 28	14° S. 14° W.	77	74	72	...	77	74	73	L.	78	79	78	a ¹	L.

Nov. 29	77	75	73	a ¹	L.	78	78	76	a ¹	L.	78	76	75	a ¹	L.
" 30	77	72	74	a ¹	L.	78	75	76	a ¹	L.	79	78	78	a ¹	L.
Dec. 1	78	76	75	a ¹	L.	79	78	77	a ¹	L.	79	79	78	a	L.
" 2	79	76	77	a ¹	L.	80	78	78	a ¹	L.	...	...	...	...	...
" 3	79	77	77	a	L.	80	80	78	a	L.	80	82§§	80	a	L.
" 4	80	80	79	a	L.	82	82	80	a	L.	81||||	83	84	a	L.
" 5	81	80	79	a	L.	82½	82½	82	a	L.	82	83	83	a ¹	L.
" 6	82	80	79	a	L.	82	82	82	a	L.	83	86***	83	a	L.
" 7	...	...	...	...	...	83	83	82	a ¹	L.	84	88	84	a	L.
" 8	83	81	81	a ¹	L.	84	84	84	a	L.	86	88	85	a	L.
" 9	83	81	81	a	L.	84	...	83	a	L.	85	86	83	a	L.
" 10	83	82	80	a	L.	...	...	...	...	...	...	...	...	...	...
" 11	84	...	82	a	L.	85	...	84	a	L.	85	86	86	a	L.
" 12	...	...	...	...	...	85	83	83	a	L.	...	...	...	...	...
" 13	84	82	82	a	L.	...	...	...	...	...	86	85	83	a	L.
" 14	85	...	82	a	L.	...	...	...	...	...	...	...	...	...	...

* Main-hatch temperature found to be generally lowest, main-hatchway opening being much larger than any other.
 † Gale of wind, noon temperature of atmosphere 68°. Although the hatches, &c., were almost wholly shut, yet with a gale, so great was the ventilation below, that the noon 'tween-deck temp. was only 2° higher than that of the upper air. Compare Table F.
 ‡ Main-hatchway almost closed at 8 P.M.
 § Not close or hot below. Hatches much closed. Speed, 6 knots. It is often very cold west of the Cape, with S.E. wind. Close and hot below; hatches all open to fullest. Nearly calm; great air down fore-hatchway. Main-sail hauled up.
 ¶ After-hatchway much larger opening than the fore-hatchway.
 ** Main-hatchway wide open, and sending down a vast draught out of main-sail.
 †† Hatch openings about equalized.
 ‡‡ Nearly calm. Main and after hatchways much more open to upper air than fore.
 §§ Main-sail hauled up; no draught thus down into the 'tween decks out of main-sail. Hence the main-hatchway becomes the place of escape, there being great draught down the after-hatchway out of the mizen-topsail.
 |||| 8 P.M. After-hatchway wide open; great draught down it. Main-sail hauled up.
 ¶¶ People all on deck. Temperatures everywhere nearly equal.
 *** 8 P.M. Main-sail hauled up; all hatches wide open; 5-knot breeze; great draught down fully opened after-hatchway.
 The same state on the 7th at 8 p.m.

deck ventilation, are at once arresting to the attention, and that the opposite course of the air in such cases, proves the rule. The exceptions to the rule are, however, numerous.

It is a question whether the existence of such exceptions may not be of sufficient force as to annul the value of the rule as a fundamental principle in ship ventilation. I decidedly think not, for the operation of the rule is most effective where from bad and cold weather the hatches, &c., must be much shut, and thus when a complete system is needed; and it is least effective where, owing to the large amount of deck openings, or draughts out of sails, &c., the ventilation is so large and irregular, that probably no system could act its full part.

The simple facts which I have endeavoured to illustrate are, that the foul air of the 'tween deck being hotter than the upper air, it must ascend, and that no system of ventilation can be aught but pernicious which does not provide for this escape as its chief object.

Table F. shows how great is this difference, even to the amount of 11° . Chimneys suitable for the escape of hot and foul air must be provided, and of such a kind as are adaptable to the greatly varied directions of the winds in which a ship is placed. If the observations I have noted have been justly made, it follows that these chimneys must be at the *two extreme ends* of the 'tween decks,

thus meeting the circumstances of the two opposite directions of the wind relatively to the ship.

One can scarcely lay too much stress on the fundamental importance of means for escape of foul air rather than means for the supply of pure air; yet the latter is very commonly that which is uppermost in the minds of those who have to do with ship ventilation. When chimneys are provided which are so formed as to allow escape, the ingress down the hatches and skylight tubes of cold, pure, heavy air is tremendous. In the tropics, with the thermometer at 80° or 84° , this ingress is not felt, but when in cooler weather, the great draught down some of the hatches, &c., is most manifest, and the people have to be carefully guarded from its immediate power or shock.

Various forms of chimneys may be suitable; but I know of none so good as iron tubes (say of 12 inches in diameter), one in each of the four corners of the 'tween decks, and fitted at their tops with cowl-heads capable of being turned in any direction. If the open mouths of such cowls be always kept turned to leeward—just as must be the case with the revolving-vaned chimney-top which is intended to “cure” a smoky chimney in a house—a rush of foul air will happen up some of them. This rush is most violent. It does not occur up all at the same time; sometimes the foremost chimneys act, at others the after ones. The escape will take place at that end of the 'tween deck

which is hottest. If the escape be great at any time at either end, the cowl tubes at the opposite end—no matter in what direction they are turned—will send down the compensating rush of cold, heavy air. Hence the necessity of suspending a mat or platform in the 'tween decks at about eighteen inches below the lower open mouths of each tube, which will divert the great and dangerous indraught of cold air from the bodies of those who sleep below it, whilst it in no way impedes the escape. A surgeon in the most crowded emigrant ship, when the ship has even so low a speed as two knots an hour, may satisfy himself that the foul air is escaping: cloths held at the lower end of these tubes are carried up, and if the ship have great speed, violently so. This, as I have observed, is most strikingly seen when, from cold or heavy weather, the hatches, &c., are much closed, and when a system of ventilation is most needed.

I shall scarcely be understood as saying aught which might be thought to lessen the importance of a supply of pure air. I wish to impress on those interested in ship ventilation, that the mode of attaining this is by securing the escape of the warm foul air.

Not only must the cowls, thus at times acting as suppliers, be fitted with diffusing platforms, but all the hatchways in the 'tween decks should have complete canvas screens, capable of being rolled up or of falling to the lower deck.

These latter have long been supplied to H.M. Emigration Commissioners' ships from England.

I have known many people die on shipboard from the results of the great draughts down deck openings. We have not hitherto succeeded in obtaining from the authorities in Calcutta these diffusers and screens.

There is considerable difficulty on shipboard in arranging cowls, &c., in a manner that they will act. The eddy winds out of sails are tremendous, and counteract the natural escapes both from the hold and 'tween decks. This is one advantage in the four corner cowls before mentioned: some of them will always be found to act as chimneys. The chimneys should not be (say for the ventilation of the 'tween deck of 400 people) of more than twelve inches in diameter. The revolving shifting tops should be well arched over, and not greatly (if any) enlarged at their mouths.

The forms usually sent, are made with bell-shaped mouths, as though they were meant to send cool air below; they, nevertheless, answer well, though I think a narrower mouth would make them more perfect as chimneys.

Such iron cowl-headed tubes, if made of stout metal and well fastened, would be as safe as any means I have seen for obtaining ventilation in hurricanes, or in other circumstances where the hatchways had to be closed. But there should never be omitted to be put on board before sailing

plugs or other means of making them secure in circumstances of danger which might arise at sea. Every hatch opening in a ship's deck should have accessible, and placed in batons adjoining, its proper deck-hatches, thus always sorted and ready for any emergency. No hole for cowl-head tubes, &c., should be made in a ship's deck without placing adjoining it a plug, fitted to make all safe. In case of a hurricane (with emigrants of the 'tween decks) it might be safer to trust for ventilation, on one means or another—cowls or hatchway. This could only be decided at the time; but every ship should have the means *at hand*, and seen to fit before sailing, of securing every deck opening. These means (hatches, plugs, &c.) should *not* be in the hold, but properly assorted, and made snug in the 'tween decks or on the upper deck.

Much might be said and suggested as to the details of carrying out an effective ventilation and protection in emigrant ships, but it would occupy too much space. I have alluded in these notes to ventilation in its physical point of view only.

The other aspect of the subject of ventilation on shipboard, viz., the relation of its degrees and influences on human life, and the amount best suited to the maintenance of the normal state of the body and health in different classes, is a subject so wide that one fears to enter it; but as a practical remark, I may venture to say, that we are more liable in this day to treat our emigrants

too rigorously than to supply them with too little air.

I am sure that when I first had charge of emigrants on shipboard, the fear that what is popularly known as "ship fever," (whatever different deviations from health those words may include,) would arise from want of air, was most unduly prominent in my mind; or I might, perhaps, with more truth say, that other, and at least equally important, ideas or consideration towards health, were not so prominent as it. Amongst these are the types and different natural tendencies to disease and death of certain classes, who at times mainly make up the class of emigrants.

That amount of tonic and vigorous treatment, with abundant change of air, which will make more strong and healthy those already in mental and physical vigour, will be fatal to certain weakly and differently constituted people. Warmth, sleep, quiet, are conditions essential to the maintenance or continuance of the feeble vital state of many emigrants, especially at early periods of the voyage.

The change to the sea, from the warmth and natural or habituated circumstances of an emigrant, be it from an Irish cabin and potatoes, a London stifling room, a Bengal native hut and intermittent fever region, is at once a vast change or shock to the system. The sea, to a man in health, rattles, as it were, and nerves his whole

body ; but to certain classes of the poor from the countries under consideration, the first change to the sea kills. Each race or people under such and the same change, shows its own natural tendencies or deviations. The native of India is at that period of man's age, and under the influences of the climate, &c., of the Indian continent, shows in a large historical or natural history point of view, the end of individual life, very readily, early, and often rapidly, in a grand frequency of symptoms of apparent affections of the *primæ viæ*, or death by syncope, whether it be (what we properly enough in the present state of knowledge call) cholera, dysentery, &c. ; the European in his usual bronchitis, fevers, scarlet fever, measles, &c. But apart from general ideas, it is practically true that on shipboard, when the native has changed his climate, soil, diet, and all else (of the known and unknown of what is different in relation) that is changed, between the land and the sea, in the widest differences of these two states of the earth's surface, that he dies very readily, in greatly increased proportion to his usual mortality, and that the life of an individual ceases in the direction (if I may so express it) of his natural and necessitous forces or "forms." He shows the same direction of deviation of action as when on shore, viz., cholera, dysentery, intermittent fever, &c.

And so also the European emigrant, of a low physico-vital frame, and therefore generally of low

mental force, whether from Ireland, the Highlands or England, like the native of India, shows those deviations from health (so-called diseases) to which he tended of necessity on shore. Low types of ship fever (so called), insidious low inflammations of the lungs, or fever, diarrhœas, scarlatina, &c.

Into the great questions of the immediate and actual facts or states on which man's health and life, and its cessation, most nearly depend, I do not presume to enter; but if these general ideas of man and his health, and its cessation, be towards the truth, and referring to ventilation, there will be found much reason to think that a severely tonic treatment is full of danger and death, to the Coolie especially. It is why, I have urged that quiet, rest, warmth, &c., have great place in maintaining the even balance between death and life to his quivering vital powers.

I have before sufficiently alluded to the vast ventilation which goes on in a ship under sail, and I hope no one who practically knows this, will understand me as holding opinions which would lead to the practice of reducing ventilation on ship-board, to the amount of an impure air. One may further remark, that to the convalescent of diarrhœa on shipboard, the exposure, in suitable weather, during several hours a day, to the air and sun, gives new life and recovery of strength, most rapidly.

But one may, I think, with truth remark, that

amongst some European people, habits, houses, and rooms were and are found to be general, which are more irrational than are (in reference to sleep and ventilation) the habits and practice of any other races. Thus, in the progress of civilization, the London plastered room, in which a family live, is less rational and less wholesome than in India, is a bamboo or mud hut with its leaf roof. Against this so general disregard of the state of man in relation to nature and air, has set in so strong a current of opinion and truth, that we on shipboard (and perhaps others) forget that man's health is not of one type, nor to be best maintained (as its physical state now is, in whole races) by perfect ventilation, or extreme atmospheric exposure alone. The fire, when low, is put out by too strong a use of the bellows.

In antagonism to the startling fact of the emigrant's tendency to death when taken to sea, we may not, in our present state of knowledge, be able to restore wholly, the necessary and actual wants of his system, in such new and unaccustomed physical relations ; but we have, I believe, carefully to remember, that man has two states : one of sleep, in which warmth and less air are needed than during the day ; that (whatever this may mean) the sea air is strong ; and that a hardy, well-fed, active European is glad of an extra coat, when leaving on a summer day the shore for a few miles ; that what we call, in our present ignorance of the actual facts

and occurrences which happen in the body, a "shock," is felt to the system; that these and many other circumstances which may be observed, direct the medical officer in charge of emigrants to a most carefully protective method of treatment, giving due but moderate ventilation, rather than to the really severely tonic and depressing one, which great ventilation, as it is called, implies.

II.—CALCUTTA COOLIE EMIGRANT SHIPS.

THE iron ship *Oasis*, of 1116 tons, embarked 446 Calcutta Coolie emigrants, on September 2nd, 1865. We left Garden Reach on September 3rd, passed the Sand Heads on the 6th, put into Table Bay on November 13th, and arrived at Demerara on December 19th. The entire voyage was 105 days.

Forty-two deaths and four births occurred.

The following table shows the total numbers embarked, and the total deaths:—

	Adults.		Children. 1 to 10 years.		Infants. Under 1 year.		Totals.
	M.	F.	M.	F.	M.	F.	
Embarked	294	76	31	12	17	16	446
Deaths { East of Cape	7	4	3	4	6	7	31
{ West of Cape	3	...	2	2	2	2	11

I will endeavour to give a simple account of the facts and circumstances of this large mortality, and as shortly as clearness will allow.

Some general principles will necessarily come

under consideration, as inseparable from any details of facts, but I try to limit them.

The following tables show the periods of the voyage at which the deaths occurred, and the diseases :—

Period of Deaths.

Dates.	Days.	Places.	Adults.		Children.		Infants.		Born on Board.		Totals.
			M.	F.	M.	F.	M.	F.	M.	F.	
Sept. 2	...	Calcutta : Embarked }	294	76	31	12	17	16	...	...	446
Sept. 6	5	Calcutta to Sand Heads }	...	...	...	...	...	...	...	...	...
Sept. 30	24	Sand Heads to Equator }	5	1	2	2	3	3	...	1	17
Oct. 21	22	Equator to Tropic }	1	...	1	2	3	2	...	...	9
Nov. 12	22	Tropic to Cape }	1	3	...	...	...	1	...	...	5
Nov. 21	9	Cape to Tropic }	2	...	1	1	1	...	1	...	6
Dec. 10	19	Tropic to Equator }	1	...	1	1	...	...	...	...	3
Dec. 19	9	Equator to Demerara }	...	...	...	...	...	2	...	...	2

Diseases.

	Adults.	Children.	Infants.	Notes.
Dysentery	3	...	...	Rapid cases.
Diarrhœa	6	9	2	{ Long-continued diarrhœa in most cases.
Bronchitis & chest affections	3	1	7	{ Most of these cases had also old mucous diarrhœa. Hooping-cough had a remittent type.
Fevers.....	1	...	...	{ Intermittent and remittent fever were common in the course of diarrhœa and chest affections.
Emaciation.....	...	1	7	{ Incredibly thin children, who showed great tenacity of life.
Unknown.....	1	...	1	...

The large mortality in this ship, amounting to 14 adults, 11 children, and 17 infants, must, if viewed in its plain facts, lead to an approach to true views. Although one cannot hope at present to state in what immediate facts or conditions of the Calcutta Coolie his tendency to die most nearly depends, yet an attempt to see things which relate to him and his state as they actually are and exist will put us in a right direction.

Such a simple and true view is not easily taken, for we are continually apt to rest the mind on some (to us) new aspect of any fact as a so-called "cause," but which may not only not give light, but bind us down to ignorance and error.

To justify myself, or to apologize for reference to such obvious general principles, I may say that in my intercourse with many who have had experience with Coolies, I have found illustrations of the truth of these remarks on the tendency of men to limited, and indeed very positive conclusions, on this subject; *e.g.*, one authority seriously says that pumpkins cause the cholera, dysentery, and diarrhœa; another lays it down that tamarind is a dangerous article of diet because it is "so acid," &c.; another, that the water is the source of all the mischief; others, the muddy banks of the river, the foul air of the 'tween decks, the cyclone, &c. All such views must have attention as parts of the whole question, but I have found that they, with others, are held as the common and

leading causes of the Calcutta coolie mortality ; the external and most apparent things and associations are taken as “causes” and explanations of the whole subject ! When in September, the leaf falls, it is not the cold night only—the wind only—but more than all this, the period of the leaf in its existing form has ended, the vital forces or life (so-called) are no more, and the breeze and wind which at another season, and at a different time in its age and course, would have added vigour, now fillips off its existence. So the Calcutta coolie dies.

The emigrants in this ship were recruited under the new act of 1864, which has reasonable precautions towards securing sound people. They were examined in Calcutta by four medical men besides the inspectors of the agent and protector. Two of these medical men had deliberate opportunities in their examinations ; Dr. Partridge had his usual inspection at the hour of embarkation, and I had every one (during my hurried forty-eight hours’ stay in Calcutta) under my hand and eye three times. I find that out of a list of twenty-eight I made in depôt, of those who appeared the most weakly, four only have died ; whilst others have died very rapidly, who, after long observation on board, were not known to have any special tendency to disease.

That which experience has abundantly shown, and that which every medical man must feel, is the difficulty, even with time and pains, to approach certainty in judging and deciding on the health of

the Calcutta Coolies. Pathological states often exist in them scarcely or not at all discernible to the eye, and the knowledge of which the most advanced medical science is only approaching. Just as amongst our own accustomed race, with all our accumulated experience and knowledge, a habit of observation cultivated through life is often at fault in determining the probable life or health of an individual (and this, too, in a robust race), so vastly greater is the difficulty amongst the feeble and to us less familiarly known natives of India.

Practically, in the end, every circumstance points in two directions—viz., careful selection and treatment.

It may be that one, amongst other circumstances, which will best aid selection, will be, that when, after some years, the advantages and wealth which emigration yields may induce a superior class of people to leave India.

From the physical state of many who came on board this ship, especially of the children, I cannot but think that not only Indian poverty, but semi-starvation, must have been their lot for long.

Many of these thin objects have died, but many are now, under good food, plump, playful, healthy little fellows.

Making allowance for the emigrants' errors in statements of age, a remarkable feature in many of the natives of India, of the Coolie classes, is that they often, after 25 or 30 years of age, present the

expression and appearances of 45 or 50. They are thin, the fine, smooth texture of the skin of healthy natives is gone, it is loose and baggy; the face expresses no life or spirit, the gait is inelastic.

This state of debility, or vital debility, increases at first, in many, after embarkation. Other animals, such as sheep, "fall away" during the earlier weeks of a voyage. (I doubt whether carnivorous animals would show an equal tendency.) The Coolies and the sheep alike, have not the force, or power, or state; are not of that "metal" or "form" to resist such a change in their accustomed conditions and habits.

The Coolie is an ill rice-fed, ague-suffering animal. When launched into the sea-climate, his system takes on a change of rate; some of his natural or accustomed (life-dependent) vital acts cease or alter, and thus, in one direction or another, he goes on to show his (so-called) diseases—diarrhoea, dysentery, cholera, cough, &c.—viz., those which must and do happen in or of him, and which in truth are the natural states or tendencies of his body.

Unless we arrive at correct first principles, we cannot hope to do aright in treatment, either in reference to tonic regimen or diet. By first principles is not meant the yet unattained knowledge of the Coolie's actual state, as it may, perhaps, depend on some most minute, yet all-essential want, which, if restored, would give him vital force.

If some such want be an actual one (such as quinine, arsenic, iodine, &c., supply in certain deviations of the living body) in his physico-vital system, long years may elapse ere we may perceive the happy analogy up to its discovery. Some simple element supplied may even restore a power or state which centuries of caste, fever, diet, climate, &c. may have contributed to produce ; but it is not this that is meant by first principles, but those natural facts and phenomena which may be seen by simple observation, by a mind anxious to receive and hold that which is, rather than to form opinions which our present knowledge does not permit with safety to truth.

What then can I conclude from my first two days' intercourse with these people in depôt? On September 1st, at 4 P.M., I thought them an average selection of natives : many had hot skins, but this is a common state in the evening, and was to be expected, allowing for the excitement and fatigue inseparable from the late journey down country. I found this heat of skin less general at 10 A.M. in the following morning. At 11 P.M. on the 1st, the depôt sheds resounded with cough ; it was one incessant loose or hard loud coughing from all parts of the sheds. But I have found in November and December, in walking through the native parts of Calcutta, at late hours, that from inside the huts is a constant sound of cough. I did not expect to find so much in August or Sep-

tember, during the warm south-westerly monsoon; but such an amount during the north-easterly monsoon would not have surprised me. Children, men, and women, had loose (yet hard enough to bring up) old cough. It was just as in the old bronchitic cough of the aged in an English winter, loose but yet hard enough. And this state in the young! This state *prevalent* in men of an average age of twenty-five years! After eighty days at sea, in 12° South, 18° West; cough was yet prevalent, and that too amongst those who were fine playful boys of twelve, and youths of eighteen. I may remark here how relatively and greatly the cough had lessened in two weeks after sailing; how it seemed by contrast almost to have disappeared at the end of the third week.

Two considerations present themselves: 1st. The state of the Coolie at embarkation, who at such young ages, and at such a favourable season of the year for the functions of the lungs, could so suffer: and, 2ndly. The differences contained in a change to the sea, from a land climate, and the method of management.

Referring to the first subject, and without going into any doubtful region of medical science, such a general condition of cough as that I have described, was to a practical man, at once a conviction of the vital debility of the people. Science has not yet told us what are the precise relations and states of the human body and its parts, and further, their

relation to the outer world, and all, which constitute the essentials on which health depends. In any single case, fully considered, we do not know them. The expression "vital debility" means nothing more than that the people so described tend to die more easily than other classes of men, who might be placed under the same changed conditions,—that if two selections of people are made, viz., from two distant social states, and placed under the same circumstances, the one will tend to die, whilst the other will increase its vigour. The first is conveniently, though hypothetically, said to be in a state of vital debility.

In writing on such subjects, we plunge into a large and dark region, but we need not be lost, if we hold the mind in abeyance, nor assume to know more than we have really seen and experienced; nor having reached a faint track of truth, fancy we have explored the whole region. I think then that one is justified in viewing these people as vitally feeble. This opinion, if true, has its full import both toward the selection of emigrants, and to the surgeon-superintendent in his method of management on the voyages.

Aiding in the direction of maintaining the vital powers of the Coolie during his stay in Calcutta, is his good treatment in depôt. It must be clear that rest, cheerfulness, and good food are desirable for him. Much pains are taken to make the emi-

grant happy in depôt. But in a medical point of view I cannot but think the sheds as unfit.

At all seasons the low land in the delta of the Ganges is damp. From whatever yet unknown exact states or facts, mankind, from experience, has agreed, that in tropical and other hot low damp situations, it is dangerous to sleep, not only on the soil, but even near it. In British Guiana, the Coolie huts are equally as the mansions of Europeans, built so that the lowest floor is some feet off the earth. Upper floors are esteemed more safe than the lower.

The Coolie in the Demerara depôt, in Calcutta, sleeps on the ground, a mat and a blanket only below him. I found, on going through the sheds at 11 P.M., the earth, which forms the floor of the sheds, damp. It cannot be otherwise in Calcutta. The soil inside the sheds, seemed more damp than that outside. In other respects the sheds, which are built after the native huts, are well conceived. They are long and thickly thatched; the sides do not reach quite up to the roof; the latter carries the rains well off into water channels. The sheds protect well from rain and sun.

Such is the simplicity and freedom of habit of these people, that the utmost liberty must be given them in depôt. They must be allowed to cook in groups of caste, or family, and at hours they may prefer. The climate also compels that they

be allowed to cook inside or outside the sheds, as they choose. Cooking inside causes some damp. It is urged, that any more fitments in the sheds would only tend to prevent the drying of this earth and impede ventilation, and be incompatible with the freedom essential to these people's habits and comforts. It is scarcely necessary to say how cautious the agents have to be not to neglect to comply with the simple, yet obstinate, habits of a people where caste-feeling is all-ruling.

But I believe there would be no difficulty in making suitable sleeping arrangements, viz., that they should sleep on well-raised platforms carried around the depôt sheds—say at 4 feet 6 inches above the ground—dirt would not be hidden, nor would there be any danger of fire from allowing the Coolie to cook in the sheds as he now does. The height and depth of the sheds should, with such a change, be increased. In the Trinidad Coolie depôt moveable wooden platforms have been used some years.

Certain reasons are adduced in favour of the existing system. It is said that most natives through life, sleep on the ground; but it is not therefore desirable that they should do so, either in their homes or in depôt. I cannot state whether it is true, that the great mass of the natives of India sleep on the ground; as far as my observation has gone, such is not the case. But even granting that it were, it may yet not be good.

But further, at this time, most of the Calcutta Coolie emigrants are up-country people. If they ever sleep on the ground when at home, in their native and habituated climate and soils, it very far from follows that it is safe for them to do so in the damp and very different physical regions, of the mouths of the Ganges, and that, too, when off a long journey, and when their systems, through fatigue, anxiety, and the inseparable depressions of the early stages of an emigrant's movements, are prone to pass into disease.

I do not write thus under an impression that any marked result is to be expected in lessening Coolie mortality by improving depôts, but I feel sure, that such a change as I have referred to, is not only toward the right direction, but very obviously and urgently needed.

The Coolie, on arrival in Calcutta, is often off a long march, in a comparatively reduced bodily state, &c. The depôt should not only afford him its food, freedom, and cheerful comfort, such as it now does, but also an accommodation for sleeping dry, and raised from the ground, well ventilated, but not draughty.

In this ship *Oasis*, the physico-vital state of the Coolie, was low to an extreme degree. I rest this statement on the fact of the almost unexceptional prevalence of old coughs amongst them; a state whose extreme degrees lasted three weeks after sailing, but from which they have never wholly

recovered, for now (ninety days out, December 4th, 7° South, 26° West) they are barking all around me.

Should not *such* people, placed under the fatigues, depressions, changes, &c., inseparable from the condition of emigrants, and those, too, emigrants of the most feeble and ill-fed of races, have the *utmost* precaution taken for them in depôt?

I conceive that not only such a bronchitis may receive support and development from sleeping on the ground, but that other ceasings of health and strength, to which his system tends, cholera, dysentery, diarrhœa, fever, &c. may not be less placed in course.

Disease (or the altered, but contained rate of normal process) in any people, arises not a little from some change between the relation of man's body and its habituated external existences. I doubt not, but that very nearly allied changes and states, are at different times the steps into cholera, fever, dysentery, diarrhœa, pneumonia, &c.

The people, such as I have described, were embarked under most favourable circumstances. The weather was warm without rain. Awnings were spread during the four days in the river, both day and night. The awnings, high bulwarks, and the fine nights, allowed one-third of the people to sleep with safety on deck. I saw two cases of cholera in the depôt hospital the evening before embarkation, yet no other happened amongst the

people, either in the river or during the voyage; except the continued, though gradually decreasing cough, we were very free from disease.

The number of cases of diarrhoea, dysentery, and intermittent fever, was less than in two former voyages, when sailing from Calcutta, in the cold north-east monsoon. The wind down the Bay of Bengal was also the warm south-westerly; the weather was so warm and pleasant that meals, with perfect comfort, were served on deck. The sea-air was bracing to the Coolie, but not so cold as to be depressing. I found a great difference in this respect in my three former voyages; in each of these latter, I had been in the bay during the north-east monsoon, and although the thermometer stood at 78° at noon, yet, on the whole, the weather was cold, chilling, and depressing to the Coolie. He was generally seen dull, wrapped in his blanket, and earlier than sun-down, sought the warmer 'tween decks.

In those voyages few died; yet more suffered from diarrhoea, dysentery, and fever (from the first "shock" of the change to the sea), than in the present one,—when watching the Coolie's habits, I saw that the climate was genial.

As near as I can describe the management during the first two or three weeks, it was mildly tonic. The Coolies were necessarily on deck two hours a day at their two meals, they were up pretty much at other times, for their pipes, &c., but there was no

hurrying them up from the 'tween decks, for fear of an inadequate ventilation and foul air below. The 'tween decks being emptied at meal times, was considered sufficient for this purpose. Taking care to sweep up the 'tween decks four times a day, to have the hatches, &c., open to the fullest during the day, and to have the 'tween decks emptied as above stated—no hurrying of the people was permitted. They were allowed to lie about during the day, on deck or below, pretty much as they chose; if the cough kept any awake half the night, no one interfered with their two-hour forenoon or afternoon nap. Securing adequate ventilation and cleanliness, rest, sleep, and quiet, were considered paramount during the earlier periods of the passage.

The early results after sailing, were most satisfactory; the cough had much lessened after two weeks; at the end of the third week it had comparatively disappeared. There remained, with many, however, a loose, feeble cough, especially amongst the children.

I feel it fair to conclude, that thus knowing their state, feeling the fine warm weather and season, watching the instincts, habits, and tendencies of the people, that a treatment mildly tonic, yet with much rest and quiet, was that which was in accordance with the facts or existences on which their health depended.

The comparatively rapid recovery of the people

from cough showed the tendency of their systems, under all the circumstances in which they were placed, to restore their powers. But many of the children gradually became weaker, under combined mucous diarrhœa and chronic cough. They often clung to life for a long time—some weeks—though so weak, as to appear about to suffocate in their so feeble and long continued efforts, to cast up the secretions of the air tubes.

Would these twenty-eight children and infants have died had they remained on shore? Certainly not so soon. What or where is the fact, or state, or change, whose slight weight turned the balance towards death?

Practically, an answer to this is to say they were weakly children, and that the circumstances of ship-board life, including the bodily fatigue, different food, noise, want of rest, the depression of the sea sickness, with its attendant abstinence, together with the shock and change of clime (whatever this latter may mean and contain), so at first lessened the vital actions and circumstances of feeble systems, that life ceased.

I fail to see any special "cause," as it is called. I know that the mind is apt to rest on some special cause—some wonder; but is it not more right and nearer the truth to confess the entire need of the discovery, and in the meantime to accept those common circumstances, states, facts, and changes, on which, in the feeble, very often life or death

depends; for those, though common, contain all. Why, to some extent, does a plant die in transplanting from one clime to another, but that where it is and has been in life, it is there in its actual oneness of parts, with the soil, air and all?

Any change of atmosphere, soil, &c., to man, is a disturbance of some facts, or parts, or processes, in the life of the individual, and when that state of life is feeble, when the force, or flame, or "form" is weak, it readily ceases, and death is the natural course.

If these ideas are just, a protective, yet mildly tonic treatment is indicated, to cherish the heat and life, and to fan up the flame; not too violent a use of the bellows at first.

I thought at the time, that had we not had the warm weather of the south-westerly monsoon, but the cold north-east, our mortality would have been much greater.

These feeble children, if not in the last stage of life, were taken on deck daily, in warm clothing, once or twice, for an hour, more or less, when the weather permitted. All the food within reach was given them, but they much needed, asked, and even longed for animal food. Need I say that had such been on board, it would have been freely given to the most feeble young and diarrhœa cases, as the chief means towards recovery.

It was astonishing to see the rapid recovery of many old cases of diarrhœa and debility, both

adults and children, after leaving the Cape. They then received, in addition to their usual diet, fresh meat, potatoes, and lemons. The weather being fine, they were made to spend a few hours daily on deck. The upper-deck air seemed to give new life. But a watchful eye and judgment, on the part of the medical man, is needed; each case must be specially treated.

Of the total mortality of forty-two souls, eleven adults were east of the "Cape," and three west. The causes of death in each were alike. The ages of the first eleven deaths, were 20, 18, 28, 21, 18, 25, 25, 21, 25, 25, 30, or an average of 23 years! This fact is very important towards forming right views on the management of these people. What is there which can help us to explain a great mortality from other than zymotic diseases, at such early ages?

There were many much older people on board. It is thus, that in races of men, certain individuals early tend to die, from states inherent, and truly of the natural course of the order of animal life. In such, as in the phthisical in Europe, the life of the individual, has a natural and necessitous tendency to cease at certain periods. These events cannot properly be called "diseases."

In the study of such phenomena amongst ourselves, or in the races of India, &c., one has to guard the mind from reposing on some single observed association, rather than extending its views

and ideas to the general fact of the body's natural passage to such early states and deaths.

Thus the prevalent opinions on consumption in Europe—that it is “caused” by some cold, damp, &c., or that the cholera is “caused” by some “poison,” in air, water, or somewhere; or as in Calcutta, it is thought that mortality to Coolie emigrants results from eating tamarinds, vegetables, &c.,—all such associated circumstances and facts have their own proper import; but I feel satisfied that we do not, in viewing what is called “disease,” keep sufficiently in view the natural states and tendencies of man's body, nor remember that a diarrhœa, dysentery, or cholera is as natural, and of necessity, as much a state or part of man, as are his normal rates of function.

These remarks, although they may be thought apart from notes on a Coolie emigrant ship, yet have great bearing on principles of management, ventilation, diet, &c.

What can we safely conclude on seeing these fourteen young human animals die, within three months after sailing? No one will say that it was their vigour which killed: but can it be said that it was foul air, pumpkins, lime-juice, too good living, changed water, storms, &c. &c.?

It is time to cease, on the vastly related and great subjects of life, health, and its deviations, the habit of resting the mind on some one associated circumstance as a “cause;” though not pleasant

to ourselves, it is of the utmost consequence to confess our ignorance, and to look for and see that which really is, let it be ever so obscure and distant.

All such, and every fact such as these enumerated, must be kept in remembrance; but a plain and simple statement of the facts and history of the voyage is that from which we may hope, if not to gain any new truth, yet certainly to avoid positive error.

Nevertheless these people do die; the circumstances of life ceasing are to be found somewhere! I have tried to show (in this and former reports) that the condition of the Coolie is such, that although he may present the outer form of a man of power, yet that his vitality at twenty-five years is expended—is not; but is nearer in force or “form” that of a European of double his age. But this, and every other illustration, can never be perfectly parallel.

Some such thoughts as these are just from viewing the early ages of adult deaths, and at the early period in the voyage of this ship.

If these views are correct we must look mostly to selection.

I have ventured to suggest a protective treatment during the earlier periods of the voyage. But no rules, not liable to error and exception, can be laid down precisely. Batches of emigrants, seasons, &c., vary much. I do not think medical men of

experience would differ greatly in their main principles of management and treatment.

Twenty children and infants died east of the Cape. The seven children's ages were 5, 4, 4, 4, 3, 4, 4, years; the remaining thirteen infants were under 1 year.

Out of thirty-two children (1 to 10 years) who survived the "Cape," four only were under 5 years. Thus, the youngest of the children died. The thirteen infants who died east of the "Cape" were out of a total of 34.

Of the mortality after leaving the Cape, there were three adults of ages 18, 23, 28 years; four children of ages 6, 6, 4, 4, and four infants.

Of the fourteen adult deaths, ten were men and four women.

With a view to place the subject of Coolie mortality in a simple light, I have appended a table of the cases under treatment during three voyages. Ships—*Alnwick Castle*, 1080 tons, 1862; *Arabia*, 1000 tons, 1864; *Oasis*, 1100 tons, 1865.

Every new case, however slight, which applied for medical treatment during these three voyages, is included in the table.

The same methods of promoting the application, and of searching out sick Coolies were used.

I have thought it worth while to fill up this table, as it may be reviewed as a statement of the facts of the natural history of the native, under certain new, to some degree known, and even experimental, conditions.

Weeks	1st Week.			2nd Week.		
Weeks ending { ...	Nov. 4, 1861.	Jan. 13, 1863.	Sept. 9, 1865.	Nov. 11, 1861.	Jan. 20, 1863.	Sept. 16, 1865.
Ships.....	Alnwick Castle.	Arabia.	Oasis.	Alnwick Castle.	Arabia.	Oasis.
Noon Temperature	80°	76½°	91°	83°	87°	86½°
Lowest Night } Temperature } .....	...	62°	84°	...	80°	79°
Latitude	11° N.	15° N.	16° N.	Line	Line	12° N.
to Longitude	E.	E.	E.	E.	E.	E.
Dysentery	11	24	6	14	11	7
Diarrhoea.....	25	43	16	40	27	13
Diarrhoea with Col- } lapse, Cholera } .....	...	...	1 ?	...	...	...
Intermittent Fever	250	17	15	20	14	8
Acute Bronchitis ...	3	...	3	...	2	4
Mild Remittent } Fever and Bron- } chitis } .....	...	...	...	...	...	...
Whooping Cough ...	...	...	...	...	...	...
Small Pox, or } Chicken Pox..... } .....	...	...	...	...	...	...
Splenitis .....	...	...	...	...	...	...
Rheumatism .....	...	...	...	1	...	...
Phlebitis .....	...	...	...	...	...	...
Scurvy .....	...	...	...	...	...	...
Debility .....	...	...	...	...	2	...
Conjunctivitis .....	...	2	...	...	1	1
Ulcers of Cornea ...	...	...	...	...	1	...
Night-blindness.....	...	1	...	1	7	...
Ulcers	5	2	...	...	2	...
Boils.....	...	...	1	...	...	...
Abscess .....	...	...	...	...	...	...
Enlarged Parotids .	...	...	...	...	...	...
Phthisis Pul. ....	...	...	...	...	...	...
Hydrocele	1	...	...	...	...	...
Herpes.....	...	...	...	...	...	...
Lumbrici.....	...	...	...	...	...	...
Tape-worm.....	...	1	...	...	...	...
Colic Pains .....	...	...	...	...	...	...
Costive.....	20	16	6	17	8	6
Delirium .....	...	1	...	...	...	...
Attempts at Suicide	1	...	...	...	...	...
Epilepsy .....	...	...	...	...	...	1
Croup .....	...	...	...	...	...	...
Injuries .....	...	...	...	...	...	...
Labours .....	...	1	...	...	...	...
Gonorrhœa .....	...	1	...	...	2	...
Syphilis	1	1	...	...	...	...
Scabies.....	...	...	...	...	...	...

Weeks	3rd Week.			4th Week.		
Weeks ending {	Nov. 18, 1861.	Jan. 27, 1863.	Sept. 23, 1865.	Nov. 25, 1861.	Feb. 3, 1863.	Sept. 30, 1865.
Ships.....	Alnwick Castle.	Arabia.	Oasis.	Alnwick Castle.	Arabia.	Oasis.
Noon Temperature	86°	84°	86°	80°	85°	86°
Lowest Night } Temperature } .....	...	76°	79°	...	79°	77½°
Latitude	9° S.	12° S.	9° N.	21° S.	24° S.	Line
to Longitude... ..	E.	E.	E.	63° E.	...	...
Dysentery	12	3	20	8	7	5
Diarrhœa.....	15	12	14	15	12	15
Diarrhœa with Col- lapse, Cholera }	...	...	...	...	...	...
Intermittent Fever	14	3	6	17	5	10
Acute Bronchitis ...	1	...	2	3	...	5
Mild Remittent Fever and Bron- chitis }	5	...	...	1	...	...
Whooping Cough...	...	...	...	...	...	...
Small Pox, or Chicken Pox..... }	...	1	...	...	5	...
Splenitis	1	...	...	1	...	...
Rheumatism	1	...	...	1	...	...
Phlebitis .....	...	...	...	...	...	...
Scurvy .....	...	...	...	...	...	...
Debility .....	...	...	...	...	...	...
Conjunctivitis .....	...	...	1	...	...	...
Ulcers of Cornea ...	...	...	1	...	...	1
Night-blindness.....	...	8	...	...	9	...
Ulcers .....	...	...	...	...	...	...
Boils .....	...	...	1	...	...	...
Abscess .....	...	...	...	...	2	...
Enlarged Parotids .	...	...	...	...	...	...
Phthisis Pul. ....	...	...	...	...	...	...
Hydrocele .....	...	...	...	...	...	...
Herpes.....	...	...	...	...	...	...
Lumbrici.....	...	...	...	...	...	...
Tape-worm.....	...	...	...	...	...	...
Colic Pains.....	...	...	...	...	...	...
Costive.....	8	4	3	6	4	3
Delirium .....	...	...	...	...	...	...
Attempts at Suicide	...	...	...	...	...	...
Epilepsy	1	...	...	...	...	...
Croup .....	...	...	...	...	...	...
Injuries .....	...	...	...	...	...	...
Labours .....	...	...	1	...	...	...
Gonorrhœa.....	...	1	...	1	...	...
Syphilis .....	...	...	...	...	...	1
Scabies.....	...	...	...	...	...	...
Measles .....	...	...	1	...	...	...

Weeks	5th Week.			6th Week.		
Weeks ending..... {	Dec. 1, 1861.	Feb. 10, 1863.	Oct. 7, 1865.	Dec. 7, 1861.	Feb. 17, 1863.	Oct. 14, 1865.
Ships.....	Alnwick Castle.	Arabia.	Oasis.	Alnwick Castle.	Arabia.	Oasis.
Noon Temperature	74°	78°	85°	68°	78°	81°
Lowest Night } Temperature } .....	...	73°	82 $\frac{1}{2}$ °	...	68°	75°
Latitude	29° S.	29° S.	3° S.	33° S.	35° S.	10° S.
to Longitude	45° E.	...	...	30° E.	30° E.	E.
Dysentery	8	6	...	4	16	3
Diarrhoea.....	13	6	15	7	9	6
Diarrhoea with Col- } lapse, Cholera }	1	...	...	1	...	...
Intermittent Fever	6	3	2	14	6	2
Acute Bronchitis ...	1	1	2	3	1	1
Mild Remittent } Fever and Bron- } chitis	2	...	...	...	...	...
Whooping Cough...	...	...	...	...	...	...
Small Pox, or } Chicken Pox..... }	...	...	...	...	2	...
Splenitis .....	...	...	...	...	...	...
Rheumatism .....	...	...	...	2	...	...
Phlebitis	1	...	...	...	...	...
Scurvy .....	...	...	...	...	...	...
Debility	1	...	...	...	...	...
Conjunctivitis .....	...	...	...	...	...	...
Ulcers of Cornea ...	...	...	...	...	1	1
Night-blindness.....	...	...	1	...	...	...
Ulcers	1	...	...	...	...	...
Boils.....	...	...	2	...	...	1
Abscess .....	...	...	...	...	...	...
Enlarged Parotids .	...	...	...	...	...	...
Phthisis Pul. ....	...	...	...	...	...	...
Hydrocele .....	...	...	...	...	...	...
Herpes.....	...	...	...	...	...	...
Lumbrici.....	...	...	...	...	...	...
Tape-worm .....	...	...	...	...	...	...
Colic Pains .....	...	...	...	...	...	...
Costive.....	10	4	2	7	3	2
Delirium .....	...	...	...	...	...	...
Attempts at Suicide	...	...	...	...	...	...
Epilepsy .....	...	...	...	...	...	1
Croup .....	...	...	...	...	...	1
Injuries .....	...	...	...	...	...	...
Labours .....	...	...	...	1	1	...
Gonorrhœa .....	...	...	...	2	...	...
Syphilis	1	...	...	...	...	...
Scabies .....	...	...	...	...	...	...

Weeks	7th Week.			8th Week.		
Weeks ending..... {	Dec. 14, 1861.	Feb. 24, 1863.	Oct. 21, 1865.	Dec. 21, 1861.	Mar. 3, 1863.	Oct. 28, 1865.
Ships.....	Alnwick Castle.	Arabia.	Oasis.	Alnwick Castle.	Arabia.	Oasis.
Noon Temperature	65°	77½°	78°	73°	81°	73°
Lowest Night } Temperature } .....	...	69°	65°	...	75°	79°
Latitude	26° S.	19° S.	23° S.	14° S.	12° S.	28° S.
to Longitude	4° W.	W.	56° E.	19° W.	W.	E.
Dysentery	7	7	...	9	12	...
Diarrhœa	14	6	7	18	26	4
Diarrhœa with Col- } lapse, Cholera }	...	...	...	...	...	...
Intermittent Fever	10	3	2	3	6	...
Acute Bronchitis ...	1	2	2	4	...	...
Mild Remittent } Fever and Bron- } chitis	2	...	...	...	...	...
Whooping Cough ...	...	...	...	...	...	2
Small Pox, or } Chicken Pox..... }	...	...	...	...	...	...
Splenitis .....	...	...	...	...	1	...
Rheumatism	1	...	...	6	...	...
Phlebitis .....	...	...	...	...	...	...
Scurvy .....	...	...	...	...	...	...
Debility	3	...	...	1	...	...
Conjunctivitis .....	...	...	...	...	...	...
Ulcers of Cornea ...	...	2	...	...	...	...
Night-blindness .....	...	...	...	...	...	1
Ulcers .....	...	...	...	...	1	...
Boils .....	...	...	1	...	...	2
Abscess .....	...	...	...	...	2	...
Enlarged Parotids .	...	...	...	...	2	...
Phthisis Pul. ....	...	...	...	...	...	...
Hydrocele	1	...	...	...	...	...
Herpes .....	...	...	...	...	...	...
Lumbrici .....	...	...	...	...	...	...
Tape-worm .....	...	...	...	...	...	...
Colic Pains .....	...	...	...	...	...	...
Costive	5	...	1	5	3	1
Delirium .....	...	...	...	...	...	...
Attempts at Suicide	...	...	1	...	...	...
Epilepsy .....	...	...	...	...	...	...
Croup .....	...	...	...	...	...	...
Injuries .....	...	...	...	1	...	1
Labours .....	...	...	...	...	1	...
Gonorrhœa	1	...	...	...	...	...
Syphilis .....	...	1	...	1	...	1
Scabies.....	...	...	...	...	...	...

Weeks	9th Week.			10th Week.		
Weeks ending..... {	Dec. 28, 1861.	Mar. 11, 1863.	Nov. 4, 1865.	Jan. 4, 1862.	Mar. 18, 1863.	Nov. 11, 1865.
Ships.....	Alnwick Castle.	Arabia.	Oasis.	Alnwick Castle.	Arabia.	Oasis.
Noon Temperature	78°	83°	73°	82°	86°	70°
Lowest Night } Temperature } .....	...	78°	63 $\frac{1}{2}$ °	...	78°	66 $\frac{1}{2}$ ° 8 p.m.
Latitude	5° S.	2° S.	30° S.	3° N.	2° N.	Cape.
to Longitude	25° W.	W.	40° E.	45° W.	47° W.	Cape.
Dysentery	1	2	2	2	4	1
Diarrhoea.....	10	13	3	15	6	10
Diarrhoea with Col- lapse, Cholera } .....	...	...	...	...	...	...
Intermittent Fever	8	10	2	5	9	...
Acute Bronchitis ...	10	1	1	6	2	...
Mild Remittent Fever and Bron- chitis }	1	...	...	...	...	...
Whooping Cough ...	...	...	1	...	...	2
Small Pox, or Chicken Pox..... } .....	...	...	...	...	...	...
Splenitis .....	...	...	...	...	...	...
Rheumatism	2	2	...	6	...	...
Phlebitis	1	...	...	...	...	...
Scurvy .....	...	...	...	...	...	...
Debility	1	...	...	3	...	...
Conjunctivitis .....	...	...	...	...	...	...
Ulcers of Cornea ...	...	...	...	...	...	...
Night-blindness.....	1	...	...	...	...	...
Ulcers .....	...	...	...	...	...	...
Boils.....	...	...	1	...	...	...
Abscess .....	...	...	...	...	...	...
Enlarged Parotids .	...	...	...	...	...	1
Phthisis Pul. ....	...	...	...	1	...	...
Hydrocele .....	...	...	...	...	...	...
Herpes.....	...	...	...	...	...	...
Lumbrici .....	...	...	...	...	...	...
Tape-worm .....	...	...	...	...	...	...
Colic Pains .....	...	...	...	...	...	3
Costive	3	1	2	7	...	...
Delirium .....	...	...	...	...	...	...
Attempts at Suicide	1	...	...	2	...	...
Epilepsy .....	...	...	...	...	...	...
Croup .....	...	...	...	...	...	...
Injuries .....	...	...	1	...	1	...
Labours .....	...	...	...	1	...	...
Gonorrhoea .....	...	...	...	...	...	...
Syphilis .....	...	...	...	...	...	...
Scabies.....	...	...	...	...	...	...

Weeks	11th Week.			12th Week.		
Weeks ending..... {	Jan. 11, 1862.	Mar. 25, 1863.	Nov. 18, 1865.	Jan. 18, 1862.	...	Nov. 25, 1865.
Ships.....	Alnwick Castle.	Arabia.	Oasis.	Alnwick Castle.	Arabia.	Oasis.
Noon Temperature	82°	83°	65°	...	...	72°
Lowest Night } Temperature } .....	...	78½	64° 8 p.m.	...	...	70° 8 p.m.
Latitude	Port of Spain. W.	Deme- rara. W.	27° S.	...	...	18° S.
to Longitude			O.			7° W.
Dysentery	1	...	1	1	...	1
Diarrhœa.....	10	1	4	4	...	7
Diarrhœa with Col- } lapse, Cholera }	...	...	...	...	...	...
Intermittent Fever	8	6	2	7	...	2
Acute Bronchitis ...	10	...	3	3	...	2
Mild Remittent Fever and Bron- } chitis .....	...	...	...	...	...	...
Whooping Cough ...	...	...	1	...	...	2
Small Pox, or } Chicken Pox .....	...	...	...	...	...	...
Splenitis .....	...	...	...	...	...	...
Rheumatism	3	...	...	...	...	...
Phlebitis .....	...	...	...	...	...	...
Scurvy .....	...	...	...	...	...	...
Debility .....	...	...	...	3	...	...
Conjunctivitis .....	...	...	...	...	...	...
Ulcers of Cornea ...	...	...	...	...	...	...
Night-blindness.....	1	...	1	...	...	...
Ulcers .....	...	...	...	...	...	...
Boils .....	...	...	1	...	...	...
Abscess .....	...	...	...	...	...	...
Enlarged Parotids...	...	...	...	...	6	...
Phthisis Pul. ....	...	...	...	...	...	...
Hydrocele .....	...	...	...	...	...	...
Herpes .....	...	...	...	...	...	...
Lumbrici .....	...	...	...	...	...	...
Tape-worm .....	...	...	...	...	...	...
Colic Pains .....	...	...	1	...	...	2
Costive	3	...	1	1	...	2
Delirium .....	...	...	...	...	...	...
Attempts at Suicide	...	...	...	2	...	...
Epilepsy .....	...	...	...	...	...	...
Croup .....	...	...	...	...	...	...
Injuries .....	...	...	...	...	...	...
Labours .....	...	...	...	...	...	...
Gonorrhœa .....	...	...	...	...	...	...
Syphilis .....	...	...	1	...	...	...
Scabies .....	...	...	...	...	...	...

Weeks	13th Week.	14th Week.	15th Week.
Weeks ending..... {	Dec. 2, 1865.	Dec. 9, 1865.	...
Ships.....	Oasis.	Oasis.	Oasis.
Noon Temperature	78°	86°	...
Lowest Night } Temperature }	78° 8 p.m.	86° 8 p.m.	...
Latitude	8° S.	2° S.	Demerara.
to Longitude	20° W.	34° W.	...
Dysentery .....	...	...	...
Diarrhœa.....	3	2	...
Diarrhœa with Col- } lapse, Cholera } .....	...	...	...
Intermittent Fever	5	2	...
Acute Bronchitis ...	2	2	...
Mild Remittent } Fever and Bron- } chitis } .....	...	...	...
Whooping Cough ...	3	...	...
Small Pox, or } Chicken Pox } .....	...	...	...
Splenitis .....	...	...	...
Rheumatism .....	...	...	...
Phlebitis .....	...	...	...
Scurvy .....	...	...	...
Debility .....	...	...	...
Conjunctivitis .....	...	...	...
Ulcers of Cornea ...	...	...	...
Night-blindness	1	2	...
Ulcers .....	...	...	...
Boils .....	...	...	...
Abscess .....	...	...	...
Enlarged Parotids .	...	...	...
Phthisis Pul. ....	...	...	...
Hydrocele .....	...	...	...
Herpes .....	...	...	...
Lumbrici .....	...	...	...
Tape-worm .....	...	...	...
Colic Pains	1	...	...
Costive	1	...	...
Delirium .....	...	...	...
Attempts at Suicide	1	...	...
Epilepsy .....	...	...	...
Croup .....	...	...	...
Injuries .....	...	...	...
Labours .....	...	...	...
Gonorrhœa .....	...	...	...
Syphilis .....	...	1	...
Scabies.....	...	...	...

The ship *Alnwick Castle* lost five Coolies, out of 479 ; the *Arabia* lost five Coolies out of 406 ; the *Oasis* lost forty-two Coolies out of 446.

The temperatures are given of the middle day in each week.

Boils, constipations, and night blindness, were more frequent than the table gives.

A form of herpes was almost universal amongst the adults. In the *Oasis* it was very severe, often forming large sores.

Scabies (a severe eruption on the hands, buttocks, &c.) was very prevalent in the *Oasis* toward the end of the passage.

In the return of bronchitis, the acuter cases only are noted.

Scurvy, in the form of puffy gums, was common in all the ships ; such cases are not noted in the table, they show themselves in the return of dysentery, diarrhoea, eye cases, boils, &c.

Lumbrici were common amongst adults and children ; they are often vomited up. Post-mortem examinations often showed them.

The noon temperatures of the ship *Alnwick Castle* are not, without a caution, to be taken as a guide to the climate experienced. The N.E. monsoon blew to 6° N. The evenings were cold and very chilling, far beyond what might be expected. We were glad to put on warm clothing in the Bay of Bengal at sundown. But in the *Oasis* the nights and days, in

the S.W. monsoon, in the Bay, were intensely oppressive.

Amongst the more prominent facts deducible from the table, are the large number of cases of diarrhœa, dysentery, and intermittent fever, at the *earliest periods* of the passage. That is to say, that which is commonly called an “outbreak” occurred on sailing, of those diseases to which the native is liable. It is the same with cholera, at some other times. The first influences of the sea, and its existences or parts,—or the loss, to the Coolie, of the parts or existences of his accustomed habitat on the land, are to his system the necessary occasions or sources of disease and death; but not permanently so, for after a few weeks, in those who remain, life seems renewed in force; they become more healthy, cheerful, and increase in weight. But some linger all the voyage, thin and in precarious health, but without discovered cause.

The type of the diarrhœa, dysentery, and bronchitis is low. Fatal and other severe cases, come on without a recognised period of heat or high pulse. If heat and uneasiness exist, the patient supposes that he is suffering from a recurrence of the slight intermittent fever, to which he is so liable. We have opportunities of treating cases in the most early stages; I have, with rare exceptions, treated acute diarrhœa and dysentery with ipecacuanha, associated with hot fomentations over the whole abdomen, kept up with spongio-piline.

Astringents, in any but chronic diarrhœa, were rarely used, and even in these with but little benefit.

In the *Oasis*, in cases of old and severe diarrhœa, with extreme emaciation, to which after calling at the Cape, were freely given meat, potatoes, and lemons, great good resulted. Sulphate of copper and opium, acetate of lead and opium, kino, catechu, opium, chalk, &c. &c., had been freely given. I could satisfy myself of no marked good from them. Indian hemp and opium were given to all who had been in the habit of using them.

The fact of the *early* outbreak of the natives' natural diseases is full of significance and instruction. It tells of the tender susceptibility of his system, to lose or increase under the *change* (whatever facts that change may contain) to the sea, those so-called "powers" or states which are parts of his life.

I will not go into the subject of management, except to say, that the direction must be toward avoiding all lowering influences,—giving rest, quiet, sleep, due but not excessive ventilation.

It is interesting to observe, that in each of these voyages, it has not been one so-called "disease" which has broken out, but bowel complaints, coughs, intermittent fevers, &c. Cholera shows a similar history. These, then, so-called "different diseases" are the resulting facts of one and the same external conditions; or at least the actual condi-

tions of each are sometimes, relatively with man's body contained in the *same change* to the sea.

Whilst most anxiously securing due ventilation, one would be anxious not to reduce by the shock of a great and continuous change of atmosphere in a ship under weigh, the heat and other life-essential states of the Coolie's system.

Seeing that at different times the native's body, when taken out to sea, shows different symptoms; at one time cholera, at another intermittent fever, at another diarrhœa, at another other continued fevers, &c. &c.; it is plain that these different phenomena, or diseases, are his natural and necessitous tendencies, under certain physical circumstances, of which the contained change of a removal from the shore to the sea is one. Doubtless the essential parts, or facts, of such a change, as potential to the native's system, may and do often occur on shore at different times and seasons. This instance of the change to the sea, allowing cholera, fever, diarrhœa, &c. to appear, is useful to us, as taking our minds off the doubtful hypothetical "poisons."

It is important, then, to see, that which we hypothetically, and in the present state of our knowledge, call the different diseases, such as the diarrhœa, dysentery, fevers, cholera, &c. of the Calcutta Coolie, are also very much one and the same, in their conditions, origin, development, and in their relation to the animal system.

If the Calcutta Coolie's body, when changed from his soil, and habitat, and all, to the sea, shows such apparently different phenomena, we must not less remember that it may yet be, that a profound oneness is of vastly greater significance and existence, rather than the more apparent and distinctive differences; and that a management and treatment, if not identical, yet running parallel, may be called for, in a diarrhœa, cholera, intermittent fever, dysentery, &c.

These general principles have their chief force, as applicable to the management of the Coolies, during the earlier days and weeks of the voyage.

A very remarkable difference existed between the ships *Alnwick Castle* and *Oasis*. In the former, on the first day after leaving the river and Sandheads, that is, on getting out to sea, half the Coolies suffered intermittent fever. In the *Oasis* the cases of intermittent fever were very few, as shown in the following table of the latter ship:—

	River.			Saugor.	Bay of Bengal.					
	2	3	4		6	7	8	9	10	11
September	2	3	4	5	6	7	8	9	10	11
Intermittent Fever.....	—	3	—	6	1	3	2	4	2	3

The weather of the *Oasis* was the warm S.W. monsoon, whilst that of the *Alnwick Castle* was the cold N.E.

In the *Oasis* four-fifths of the people suffered from old cough at and after embarkation; but so genial was the weather, that only five cases of acuter cough occurred during the first ten days after sailing.

The absence of cholera in these two ships, and the presence of intermittent fever in the one, and general bronchitic cough in the other, recalls the mind to the consideration of the human system's tendency to the passage at one time, into one series of deviations only. Was there, to some degree, less possibility of cholera in either case, there being already intermittent fever or bronchitis? Are these conditions of human physical existence and natural order, so distinctive in symptoms or external appearance,—as truly are a cholera, a bronchitis, or an intermittent fever,—yet of a profoundly allied necessity, origin, or course? All are the contained necessity of a human being—of true natural order. But the exquisitely delicate varying rate or “form” (from that of health, which must be, not the “cause,” but the true part of each and all) has not yet been recognised.

Though not proved, yet it appears a legitimate inference to say, that the *Alnwick Castle's* Coolie's system and vitality was severely tried by the climate and change he experienced, as shown by the general access of intermittent fever, but that they were a fine selection of natives, who had vital powers to withstand its fatal influences. On the

other hand, the *Oasis* Coolie was of feeble vitality (as proved by his old bronchitis), but who, in great numbers, gradually restored their powers under the genial weather of the S.W. monsoon. Many, however, died of the shock, (want of rest, change of clime, &c. &c.) of diseases of debility; others slowly improved, or lingered weaker and weaker, to die at later periods of the passage.

Though far from enough facts to justify any positive conclusion, the experience of four Calcutta Coolie emigrant ships has gone to show, that Natives are most free from bowel complaints and fevers during the warmer damp equatorial latitudes. There has, however, been sufficient indication, that when in bracing cold "Cape" latitudes, for three or four weeks, those who are well and of good constitution remain free from disease.

I append a table of every application for bowel complaints in the ship *Arabia* from Calcutta to Demerara, January to March, 1863.

The mortality in this ship was under 1 per cent. The greatest freedom from bowel complaints was in the equatorial regions, south of the bay, and again near and in the River Demerara. I remember clearly that in both these latitudes, there was scarce a case of illness of any kind amongst the Coolies. The weather was hot, damp, and more or less calm.

The sudden increase of cases at St. Helena, and after, was associated with a change of water.

	Calcutta; River Hooghly; to Bay.										Bay to Equator.						Equator to 11° S. 80° E.					
	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
January, 1863.	62°	62°	66°	68°	70°	73°	75°	78°	77°	80°	81	79 $\frac{1}{2}$	78°	79°	80°	79°	76 $\frac{1}{2}$	78°	80°	80 $\frac{1}{2}$
Lowest Night Temperature.
New Cases of Bowel Complaints.	...	3	4 $\frac{1}{2}$	5	10	10	16	12	16	8	3	5	3	5	2	...	2	2	...	...	4	1

	To 23° S. 60° E.										To 30° S. 45° E.										To Cape.						Cape.
	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
January. 1863—cont.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lowest Night Temperature.	81°	81°	80°	79°	78 $\frac{1}{2}$	78 $\frac{1}{2}$	79 $\frac{1}{2}$	76°	76 $\frac{1}{2}$	73 $\frac{1}{2}$	73°	73°	73°	74 $\frac{1}{2}$	71 $\frac{1}{2}$	71°	68 $\frac{1}{2}$	68 $\frac{1}{2}$	70 $\frac{1}{2}$	72 $\frac{1}{2}$	70°	...	...	...	...	...	...
New Cases of Bowel Complaints.	3	4	1	1	1	5	3	1	...	2	4	1	...	3	1	1	...	3	5	2	...	...	...	...	...	...	...

Over.

The most common diseases of the natives, viz., bowel complaints, intermittent fevers, and bronchitic cases, which occurred in these ships, together with the deaths from them, are given below.

	74 Days.		74 Days.		108 Days.	
	Ship <i>Alnwick Castle</i> . 476 souls.		Ship <i>Arabia</i> . 404 souls.		Ship <i>Oasis</i> . 446 souls.	
	Admis- sions.	Deaths.	Admis- sions.	Deaths.	Admis- sions.	Deaths.
Bowel complaints	265	...	246	3	167	20
Intermittent fever	112, plus half the people in the first week.	...	82	...	58	1
Chest complaints	47	3	10	1	40	12

The admissions of the ship *Oasis* were fewer than in the other ships, whilst the deaths were much more numerous. Some might prefer to say that the type of cases was severer in the *Oasis*, but it appears nearer the truth to put it in this form: that the people were less frequently ill, owing to the favourable circumstances in which they were placed, but were also a selection of much more feeble natives.

Hooping-cough showed in the *Oasis* on entering the cooler weather, on leaving the southern tropic—about twelve cases in all. The four or five adults who showed this symptom may perhaps with more truth be said to have had remittent fever, in

which sudden and large effusion into the bronchial tubes was one of the earliest and most dangerous symptoms. The danger of life from this source was past in from four to seven days. Chronic effusion remained many weeks, as did the whoop. The evening exacerbations of heat, high pulse, &c., in these cases lasted also several weeks.

Such cases have a true place in the natural history of the facts and phenomena of man's body. They are as actual and real, as are the more common, and therefore described as specific, typhus, small-pox, &c. They tell at once, that the order of change and rate of the human body, which is exhibited in its passage into the whole class of fevers (so called) has not only that which they show, but has yet many other degrees, and many other varieties and localizations. The symptoms called "hooping-cough," those called "remittent fever," and those called "sudden effusion into the bronchi," were all coexistent in these cases. The human body passes as naturally into a state, having somewhat different symptoms (ague, scarlet fever, measles, smallpox, &c.) but on the whole vastly alike, which we call fevers—and as fundamentally of its essential nature—as it passes to the growth of the limbs or to that of the normal temperature and rate of vital action.

When we call such cases "hooping-cough," "remittent fever," and "bronchitis," we are in great danger of closing out simple and wide views

by the use of words. We necessarily give rise and birth to words in our earliest and smallest and narrowest comprehension of things and ideas; but it is a great pain to find such words made the measure and encirler of larger views; or, as it may be expressed—for men to assert the measure of the little that is known, to be sufficient for what is possible and infinite.

When the mind has felt strongly the grand resemblances of so many of these symptoms (which have been too much described as different diseases), and when we know, from so many analogies in all the aspects of human knowledge, how small are the amounts of difference or rate which are the causes (so-called “causes”) of the grandest and most wide of the phenomena of all nature, we are made full of hope that the tendency of the human system to these “diseases” may be arrested by means within our reach; and, indeed, which are, no doubt, as open as is the day around us, and yet not seen.

Measles occurred in the *Oasis*. Three weeks after sailing, an apprentice, 19 years, who was much in the Coolie deck, showed measles, on September 21st. He was at once made to remain in the cabin, a part separated by a complete iron bulk-head from the Coolie's deck. A Coolie girl, aged 5, showed measles on September 29th.

That two cases, and no more, of measles occurred in a crowded community on shipboard, where

there was so large a proportion of children and other young people, most of whom had never suffered or shown this malady, is a fact as pregnant with truth for our instruction, as are the common and great phenomena, in those instances, where large numbers pass into this disease or rate. If measles when wide-spreading is an infectious or contagious "disease" or "thing," then this exhibition of it was a non-infectious one; and we have two divisions of this so-called "disease;" one catching, and the other not!

A similar limitation of hooping-cough is seen in the ship *Oasis*, and another, of what I thought at the time was modified smallpox, in the *Arabia*.

In the ship *Tarquin*, with English emigrants from Plymouth to Adelaide, in August, 1864, one severe case of confluent smallpox, occurred in a crowded community of 300 people. Out of the whole numbers on board, 136 successful vaccinations were made during a period of ten weeks. These latter had been liable to variola, and yet no other case happened.

It would be most vain and most absurd to suppose that any means used in some of the above instances arrested the spread of the diseases, nor can it be said that "THEY ceased;" but rather that the rate of vital action and function, under all the circumstances (so unknown) of the voyage, was such that these symptoms or diseases could not and did not appear. Just as—one may hypotheti-

cally put it—in the Coolie emigrant ships named, the intermittent fever or bronchitis may have been the actions of the system to the non-appearance of those slightly different (which might have been cholera); so here the bodies of the people, under the influences of forces or existences contained in the change to the sea, did not, nay could not, pass into measles, hooping-cough, or smallpox. Such a view of the subject is, I hope, of the “method” by which the mind may be left free and apt to recognise any fact, which may have place or power to give birth to true “ideas” on these large and allied phenomena.

It is gratifying no doubt to one’s mind and efforts to remember that the smallpox case was (so far) isolated, vaccination performed, swing-stoves used, chlorides of lime and zinc scattered, due ventilation and not chill or cold allowed, &c.; but it is of the utmost consequence toward just views to see and remember the wide fact, that the human system cannot (for it does not) at times take on these different rates or states (cholera, smallpox, measles, hooping-cough, &c.) from the more normal one of health. That whilst at some times and periods, it of necessity and fixed rule shows them; that at other times the normal state, or health, is the necessity.

By taking the open, simple view of any phenomena, as they actually are and exist, and as really showing themselves, we may guard ourselves not

only against the error of ascribing exemption from disease to some utterly inefficient preventive measures, but resting the mind humbly on what is known, be capable of recognising truth when it is presented. And not only so, but as bearing on the management of a Calcutta Coolie emigrant ship, we shall be apt to attach more importance to attaining a management and treatment which shall preserve and restore best the Coolie's strength and normal physical conditions, than to any wonderful curative agency.

Small-pox.—Eight cases happened in the C. C. E. ship *Arabia* ; all were east of the Cape.

Boils were common in the *Oasis* toward the end of the passage.

The cough in the *Oasis* remained to the end of the voyage, in at least 100 people. The general health in most of these sufferers, did not appear at the latter end of the voyage to be impaired ; but many of them remained weak and thin.

In most of the fatal cases in young children, classed as diarrhoea, old bronchitis was an almost equally severe symptom.

At the risk of repetition, I have enumerated some detail, as illustrative of the Tables of the diseases of the three Calcutta Coolie emigrant ships. The remarks ventured on are often hypothetical, but I hope are on a "true method." They are necessarily only approximative, and preliminary of exact inquiry and observation of those facts or re-

lations so apparently unimportant, but which are of infinite place or power to us, toward our hopes of the prevention of disease, and cure.

Where the method or spirit of an inquirer is right, whether he pursues the observation of nature from the outer aspect of phenomena, or from the inner study (and the expansion of minute discoveries of truth to their infinite relations), such his ideas, from either and both, will be in harmony.

III.—CALCUTTA COOLIE EMIGRANTS' DIET.

THE following (with some others) form the articles shipped for the Coolie's daily diet through the voyage from Calcutta to the West Indies:—

Rice.....	1 lb. 4 oz.	Onions.....	2 oz.
Dholl (a kind of pea)	4 oz.	Tobacco	1 oz.
Ghee (butter)	1 oz.	Chillies	$\frac{1}{2}$ oz.
Salt	1 oz.	Black pepper	$1\frac{1}{2}$ drachm.
Water	1 gallon	Mustard seeds.....	$\frac{1}{2}$ drachm.
Tamarind	2 oz.	Garlic	$\frac{1}{2}$ drachm.
Salt fish	2 oz.	Coriander seeds ...	2 drachms.
Mustard oil.....	$\frac{1}{2}$ oz.	Turmeric.....	$\frac{1}{2}$ oz.

“Yams and potatoes may in certain proportions be supplied as a substitute for pumpkins, and as vegetables must be served twice a week, equal to $\frac{1}{4}$ lb. per adult, the whole quantity must accordingly be provided. The emigration agent may require the substitution of flour for not more than three-fifths of rice—at the rate of 8 oz. of flour for 12 of rice. Six sheep or goats to be supplied for every 100 adults for the voyage.”

Sufficient dry provisions for bad weather are also supplied, viz., choorah (a form of cooked and dried

rice) 2 lb. per day ; gram, $\frac{1}{2}$ lb. per day. Sufficient sugar. Vegetables are shipped at $\frac{1}{2}$ lb. per adult per week.

A good supply of "medical comforts" is placed on board, of which the following are the chief articles :—

110 lbs. of preserved meats, per 100 statute adults for the voyage.

Fine flour, arrowroot, sago, soogee, &c., in abundance.

Port wine, 12 bottles, per 100 statute adults.

Brandy, 20 gallons, per 100 statute adults.

Lime juice, 10 gallons per 100 statute adults.

Grimwade's desiccated milk, 200 lb. per 100 statute adults.

Tea, 2 lb., per 100 statute adults.

Bale fruit. Condensed egg, 20 lb., per 100 statute adults.

A good supply of sugar.

As showing what are considered good native dietaries, I place below the diets of the Medical College hospital in Calcutta, page 76.

It will be easily understood that the Coolies on shipboard, when recovered from the first depression of the sea-sickness, and exposed to the tonic sea air, need a more generous diet than do the convalescents of an hospital.

That the great proportion of the Coolies fatten, and the children improve to fine strong little fellows on the present diet, is quite true. That

most of the Coolies had never before as good food may be also true; still, I think there is just and pressing need why the dietary should be improved.

	Full Rice.	Full Flour.	Mixed Full.	Half.	Milk.	Flour Milk.	Low Milk.	Low Milk.	Low.
Rice	16 oz.	16 oz.	8 oz.	12 oz.	12 oz.	...	...	2 oz.	...
Flour.....	...	...	8 oz.	...	...	12 oz.	...	...	...
Soogee .....	...	...	...	...	...	...	6 oz.	...	...
Sago .....	...	...	...	...	...	...	...	...	3 oz.
Salt	$\frac{1}{2}$ oz.	$\frac{1}{2}$ oz.	$\frac{1}{2}$ oz.	$\frac{1}{2}$	...	...	...	...	...
Ghee } (butter) }	$\frac{1}{4}$ oz.	$\frac{1}{4}$ oz.	$\frac{1}{4}$ oz.	$\frac{1}{4}$	...	...	...	...	...
Oil	$\frac{1}{4}$ oz.	$\frac{1}{4}$ oz.	$\frac{1}{4}$ oz.	...	...	...	...	...	...
Curry stuffs	...	...	...	...	...	...	...	...	...
Sugar .....	...	...	...	...	2 oz.	2 oz.	2 oz.	2 oz.	2 oz.
Fish and } vegetab. }	2 $\frac{1}{2}$ pice	1 $\frac{1}{2}$ pice	1 $\frac{1}{2}$ pice	1 pice	...	...	...	...	...
Milk .....	...	...	...	...	2 pints	2 pints	1 pint	1 pint	...
Dholl (peas)	2 oz.	2 oz.	2 oz.	3 oz.	...	...	...	...	...

The articles of food are put on board, and it is left wholly to the surgeon-superintendent to frame a daily dietary. This is no easy affair. Although seeking every information I could hope to find, I remained in great ignorance and made many serious blunders in my practice. Why should the Coolie emigrant be left, in the great matter of his daily food, in the hands of surgeons, often very ignorant of his habits, wants, and diseases? At the end of every voyage I have made with Coolies, I have urged the desirability of issuing some very general "hints" to surgeons-superintendent on Coolie dietary, &c. I have urged this from the sense of my own wants and ignorance. Such

“hints,” if not attempted to be minute or positive, would greatly aid surgeons in charge of Coolies, and benefit the Coolie. Much information must be attainable on this subject.

The present help given us is, that we are advised not to give the Coolie his full rations at first. This is so far good, and to a certain degree, worthy the surgeon's attention. In my first voyage I greatly feared to overfeed the Coolie, but each succeeding one showed me that he was benefited by good living.

That such hints are needed may be seen from facts which have come within my limited observation: *e.g.*, I have known a long voyage made without a single issue of flour. Now a great proportion of the Coolies (up-country) are accustomed to flour, and not to rice. Can any ignorance be more lamentable or unkind to the Coolie? I know that in some ships, the onions have rarely been issued to the people. Yet they are a most important and valuable (nay, one may say, essential) part of the diet. On my first voyage I was afraid (from all that I had heard) to use vegetables, onions, tamarind, lime juice, &c. I was inexperienced with Indian natives, and was necessarily timid in acting for life, health, or death, on my own practical inexperience. I saw plainly that the people were weak and needed certain foods (say onions), but was timid in giving them to a proper and safe amount. I was in danger of starving my

Coolies from the influence of the vulgar notion, that their diseases on shipboard, were induced by vegetables, tamarind, lime juice, and too good living. These opinions were those held and given to me, by almost all the officials, connected with Coolie emigration, whom I met in Calcutta. If surgeons have been much influenced by them, and if they have found, as I generally have, a dishonesty almost appalling on the part of the masters of ships, in their attempts to deprive the Coolies of their just rations and rights, I have no doubt but that one source of Coolie mortality on shipboard, has been his semi-starvation.

It may be remembered that not only in Calcutta do the opinions of cholera, &c., being "caused" by vegetables, &c., exist; the Board of Health in 1849 took similar narrow view of a great subject when they issued advice to the nation that the best mode of escaping cholera was to avoid vegetables, fruit! &c., rather than teaching the wider truth of the great importance by all habituated and simple articles of diet, of maintaining the usual state of individual health and function.

The fact is, that although it is a judicious advice to give surgeons to be cautious at first not to gorge the Coolie, yet before long he is equal to the consumption of most of the articles in the scale, and is benefited by them.

He may come on board thin, his skin baggy

and rough, and not be equal or fit for high living at first, but if he live at all, he will soon long for food, and under it, improve in spirit and strength.

I do not suggest more rice, dholl, fish, or curry stuffs. In the ship *Oasis* I used all the onions, tamarind, lime juice, and vegetables; and more of the seeds, chillies, garlic, &c., than in any previous, and with marked advantage to the people. The table of sickness shows that there have been relatively fewer cases of bowel complaint here, than in two former voyages, where these articles were less freely given; but the table does not convey as clearly the good results, as did the experience of daily observation. And indeed, when one sees the deeply scorbutic, low-fed Coolie, with his fatty degeneration of cornea, his proneness to low diarrhoea, his puffy gums, flabby flesh, and the rapid sinking of the vital powers at certain times, the demand for good varied vegetable and meat food, is carved in flesh and bone in his body.

I am not saying that at once a vastly better fare is needed than he now gets; his food must be improved with cautious steps. A human frame reduced or produced to its present state, by centuries of habits of abstinence and temperance, and by the use of a diet *scarcely* equal to, or perfect for, the animal wants, cannot be restored or improved in the short period of a voyage, or even of a life, to any marked degree; nevertheless, it is evident that

some most material want, though it may be small, is demanded in the Coolie's diet.

The diet of the native of India is one of the most interesting and suggestive subjects for study in the whole range of the natural history of the human animal. He does on his most simple foods, sustain the longest fatigues and labours. His "wind" is splendid; the functions are regular; the animal life is almost perfect. His food appears to be almost the very best, for the necessities of nature. It appears, however, as if some one small essential want only, was not sufficiently supplied, from which, amongst other material states, arises the tendency to death; the ulceration of mucous membranes, the rapid sinking of the vital powers, in short, the varied deviating phenomena which his life presents. That which is arresting to the mind in the contemplation of the native and his diet is, on the one hand, the great and almost perfection of life and function on such simple and sparse food, and on the other, the sudden and rapid ceasing of life. This tendency to rapid death, which, in its different symptoms we call cholera, diarrhoea, dysentery, fever, &c., it appears not unwise to view as the natural course and action of his life and whole history. The sudden and personally appalling phenomena of a cholera, &c., are liable to fix the attention on its outer and most prominent symptoms, rather than on the natural course or order. On other parts of nature, to which the

human thought has lain itself, or to which man's attention and ideas have lit up, his errors of method, have been of the same general order and nature. The vast periods, the actual course of time and evolving existences, and the consecutive necessity and oneness of the order of (so-called) catastrophetic phenomena, with the ordinary overlooked quiet rate of time and events, are forgotten. I conceive that whether we contemplate a revolution in society, the separation of the avalanche, the existence of animals and life on this globe, or the existence of diseases—cholera, &c.,—in man, that our first recognition of these facts is that of surprise, but that the reason in its calmness, and humility, and hope, assures itself that such events are secondary phenomena of the greater, and containing necessitous and actual rates of time and matter and “forms.” Thus, whatever the more potential circumstances of the natives' diseases may be, the thousands of years on which he has subsisted on a spare, and, perhaps, too same a diet, must form one essential—though, perhaps, of very minor import—fact in the natural history of his passage to death, in those rates which we call cholera, &c., &c. The tenacity of life in other cases, is equally striking; children and adults lingering month after month with diarrhœa, &c. &c. The qualities of the food of this ancient race, must, by such examples, be shown to be near to a just supply for human necessities.

In attempting to approach a conjecture of what

want their systems may have, our guide is to watch their instincts, in hope for the recognition of a true analogy.

When we remember the astonishing influences of some substances and products on the functions of the human body ; when—*e.g.*, we see a few grains of arsenic supply that essential part of the human frame, which sustains a normal state of skin throughout a long life, where, from its absence, a state of ichthyosis would be the normal one ; or when we see the influence of a single dose of quinine, in placing the system in a state, that the rates of life and change cannot be into that of intermittent fever ; and in so many other marvellous truths of nature, which the observation and discoveries of men have yielded—as iodine, mercury, opium, vaccine lymph, lemon-juice, &c.,—it is surely not a vain or distant hope that we may see and recognise that, perhaps, simple mineral element or other matter, whose absence is the potential necessity of those changes which do happen in us, and which are made known to us, by the symptoms we call cholera, diarrhœa, fever, &c.

In the painful ignorance of such remedies, and in the equally painful struggle of mind after the right method of feeling and thought, which can alone make us capable of recognising truth (which is in reality everywhere open and clear to such attained mental states), one must be content to name only such common circumstances as have been observed.

The Coolies in the different ships were ravenous for fresh meat. They were very fond of tea, although they had never used this in their native homes. Seeds of various kinds they like much. Onions they will steal, or adopt other means to obtain, and eat them raw. Tamarind, lime-juice, sugar-cane, potatoes, fruits, are begged for with an earnestness, which might arouse the attention of the most apathetic.

On the whole, one cannot cease to be impressed with the conviction of the wants which these people, in the simplicity of their habits, instincts, and natures, show toward a more varied and essential diet.

One might suggest for the Coolies, 1 oz. of tea per week per adult; 7 oz. of sugar as a ration, per week. If it be within the range of commerce, Liebig's Extract of Meat, of the Bavarian Pharmacopœia. A large supply of this, or somewhat similar preparation of meat, could be given in some form or other of "curry." Onions, if used or lost before arrival at the "Cape," should be made good there. An increase in relative proportion of the flour to the rice. Vegetables in greater proportion than half a pound per adult per week. At the end of the third week from sailing, in the *Oasis*, all the potatoes were used. $1\frac{1}{2}$ lb. of potatoes per adult, per week, would not be too large a supply, allowing for waste. Biscuit is now shipped, to the great bene-

fit of the Coolie. But it becomes damp and mouldy, and is unfit for human food at the end of three or four weeks. It is altogether worth while to take some pains in preserving the biscuit. Iron-bound casks or tanks are now used for stowing biscuit in emigrant ships chartered by Her Majesty's Emigration Commissioners in England. The same means should be taken in Calcutta. Economy is a very important consideration with the West India Government, where the Coolies cost so much ; but it is monstrous, when means which will keep biscuit good and wholesome are known, that they should be compelled to eat that which is green and mouldy.

Each Coolie received about 1 oz. of lime-juice per week ; it was mixed in his curried dholl, &c. ; and about 6 oz. of tamarind. I should have given the tamarind more freely, but it was not shipped ; we had not on board one-third of that stated in the charter-party. The Coolies are very fond of tamarind, and I never knew an instance of its disagreeing with them. On this subject watchful observation has been made. It is a very tart agreeable acid fruit. The Coolies eat it in its raw state, or make it into a chutney. It was issued in quantities of 2 oz. three times a week, at the dinner hour. Many would eat it up at once, and never could I find any evil or diarrhœa from its use. Indeed one would not expect such a result ; but I was deterred, during my first Coolie voyage, from its

proper use, by the vulgar notion of acids and fruits were promoters of bowel complaints. At the "Cape" we obtained 1000 lemons. They were freely given daily, especially to the diarrhœa cases, and with marked benefit. How happy I was to stop the giving of acetate of lead and opium, sulphate of copper, catechu, &c., and to give lemons, potatoes, and mutton. Before having arrived at the "Cape," and having no vegetables, fruits, or meats, most of the diarrhœa cases were sustained on flour. Coolies often loathe the continuous rice. Flour is prepared into chaupaties, which are made of a coarse flour, kneaded with water and a little salt. They are baked on an iron plate, and tossed for a moment into the wood ashes. A little butter is then thinly smeared over them. Chaupaties are the favourite food of nearly all Coolies. A Devonshire boy does not so much enjoy plum-pudding, as a Coolie his chaupaty. Inadequate means are provided for the cooking of chaupaties, for the bulk of the people; and yet the flour is perhaps even a more essential article of diet than is the rice. I would seek to direct the attention of the authorities in Calcutta, to the necessity of supplying on board, two stout sheet-iron plates, which will be adequate to bake chaupaties for all hands.

Fresh meat. The charter-party states, that "6 sheep or goats, per 100 statute adults," or 24 for the voyage, of about an average of 100 days, for

400 statute adults. One may put it, as 6 sheep for 100 adults for 100 days; or 1 sheep for 16 men for 100 days. A Calcutta sheep, when killed and cleaned, weighs from 17 lbs. to 20 lbs. Thus one adult receives, in 100 days, a fraction over 1lb. of meat, bone and all. In the *Oasis* 34 sheep were supplied. As the sheep obtained at the "Cape" are heavier than those from Calcutta, and as there were the extra ten for the whole voyage, each adult may be said to have received 2 lbs. of meat, bone included, during the 108-day voyage.

It would be as easy to carry 42 sheep, say 6 per week for 7 weeks, as 17. I would place them on the poop of the ship, in proper pens. One or two fresh-meat days could be made weekly, and were there on board a supply of Liebig's Extract, a most nutritious diet could be given. Such is the small, but not the less necessary, demand of the Coolie's system, that we have the actual opportunity of carrying sufficient "stock" for them.

Raisins—say $1\frac{1}{2}$ lb. per adult, per week, would be a valuable addition to the dietary, nor do I doubt but that almonds have powers or parts of the utmost efficacy in contributing to the vitality of the human body.

I have kept a record during three voyages of every issue of choura. Whether given dry or wet, I could never trace a case of diarrhœa to its use. So also with gram. This bean has been given

regularly when boiled, and mixed with a little ground pepper; also occasionally soaked in cold water only. I know of no instance of its disagreeing. Diarrhœa cases often long for parched gram. It was never refused; and indeed, the most marked improvement followed its use. Diarrhœa cases also crave for extra tamarind. It was always given. Next to chaupaties, ship biscuit and sugar is the favourite food of the Coolie on ship-board. Children of a year old, up to men, all take at once to munching biscuit. Seeing that they have never before eaten biscuit, and that it has not a very pleasant taste, their desire for it must indicate some want of greater variety in diet.

A few spices are not unimportant additions to the dietary.

Is there any way of putting up *pure* lime-juice that it will keep good during a three months voyage? I had a fortnight's supply of the true juice; but all the remainder was manufactured rubbish. Limes are most abundant in India. This is a most important matter.

Our knowledge on human diets is as yet very limited, though assumed to be comprehensive. The instincts and longings of the feeble are, in the vast proportion of cases, above all our superficial ignorance or knowledge. Unknown powers, properties, or combinations exist in certain foods, which are nothing short of life-giving in certain cases; nor

have we much guide in the discovery of such apt applications, but by the instincts of our patients.

I have appended (page 89) a statement of the diet issued during this voyage. A light breakfast at 9 A.M., and a good dinner at 1.30 P.M. Additional food, milk, sago, dholl cakes, &c. &c., were given to women and children.

I can recommend this scale as a good one, so far; but I am sure it may be much improved, and hope its publication will lead to other suggestions, and varieties of diet.

The subject of the diets and habits, of food and drink, of the natives of India, is one of deep interest. There we see vast races, inhabiting very different climates, subsisting on food of the most simple kind, and sustaining on it a splendid physical being. Commanded by the laws of an ancient and wise philosophy and faith, food is taken as an act of grateful worship and thankfulness to their Supreme;—a philosophy based on truth and nature has taught successfully a simplicity and perfection of those necessities which human animal life demands. The possession of boundless wealth does not to its possessor open the desires to change the simple forms of food of his race, only so far as to substitute the finer grains and qualities.

To common and superficial observation, degraded as the native may appear, one cannot but feel, on viewing his conduct and physical habits, but that a profound and just wisdom, the direct impress of

Diet given in Ship Oasis for about 375 Statute Adults.

BREAKFAST.	DINNER.	EXTRAS.
Sunday Gram,*115lbs. Salt, 2 lbs. Pepper, 1½lb. Ghee, 4 lbs.	Flour†, 328 lbs.; Dhol,§ 94 lbs. Ghee, 8 lbs.; Salt, 7 lbs.; Onions, 18 lbs.—“Curry Stuffs.” See page 90.	Tamarind, 2 oz.
Monday Biscuit,† 6 oz. to each per- son.	“Kutcherie,”|| made of— Rice, 340 lbs.; Dhol, 94 lbs.; Ghee, 12 lbs.; Onions, 18 lbs.; Salt, 8 lbs.—“Curry Stuffs.”	Chutney, ½ oz.; Wet Tobacco, 3 oz.; Oil, 1 oz.
Tuesday Biscuit	Rice, 340 lbs.; Mutton, from 51 lbs. to 111 lbs.; Onions, 18 lbs.; Salt, 4 lbs.; Potatoes, 63 lbs.; Ghee, 4 lbs.—“Curry Stuffs.”	Tamarind, 2 oz.; Salt, 2 oz.; Onions and Chillies,¶ raw, to all.
Wednesday ... As Sunday	Rice, 340 lbs.; Dhol, 94 lbs.; Onions, 18 lbs.; Salt, 4 lbs.; Ghee, 4 lbs.—“Curry Stuffs.”	Chutney, ½ oz.
Thursday Biscuit	As Sunday.	Wet Tobacco, 3 oz.; Dry To- bacco, 2 oz. Chutney, ½ oz.
Friday As Sunday	As Monday.	Chutney, ½ oz. Oil, 1 oz.
Saturday Biscuit	Rice, 340 lbs.; Fish, 120 lbs.; Salt, 2 lbs.; Potatoes, 63 lbs.; Onions, 18 lbs.; Garlic, 5 oz.; Tamarind, 24 lbs.; Oil, 3 qts. —“Curry Stuffs,” without Ghee.	Tamarind, 2 oz.; Onions and Chillies given to each.

* Gram was boiled, then to it added the butter, &c.

† For biscuit or gram, sometimes 6 oz. of dry choura was given, with 1 oz. of sugar.

‡ 328 lbs. of flour were made into about 2000 chaupaties.

§ The dhol, ghee, salt, and onions are of course all mixed and boiled with the “daily curry stuffs.”

|| In kutcherie the rice is mixed with the dhol, &c.

¶ The Coolies made chutney with their onions, tamarind, chillies, &c.; it was a nice relish for their green and mouldy biscuit. We had not sugar enough to last, otherwise one ounce would have been given with each issue of biscuit.

nature itself, is the basis of his whole life; and I believe, ere long, that not only in diet and habits, but in philosophy in its widest sense, Europeans must take lessons from the Hindoo, as wide, and deep, and true, as any which we can give him.

DAILY "CURRY STUFFS."

Lime Juice	1 quart.
Onions	8 lbs.
Garlic	5 oz.
Mustard Seed	8 oz.
Chillies	8 oz.
Black Pepper	12 oz.
Coriander Seeds	2 lbs.
Turmeric	1 lb.
Ghee	8 lbs.

CHUTNEY FOR FOUR ISSUES.

Tamarind	48 lbs.
Chillies	6 lbs.
Onions	12 lbs.
Garlic	1 lb.
Salt	4 lbs.

It is worth while observing on how small an amount of food the Hindoo body is supported, and that, too, in those who work hard, and who can and do undergo the severest trials of endurance— $1\frac{1}{4}$ lb. of rice or flour, 4 oz. of peas, a few vegetables, a little butter, and a few seeds and condiments, are his usual support. Water is his only drink. On such a diet, and but little varied, is man sustained: shewing on it, extraordinary activity, and, for his weight, great power. In childhood, boyhood, up to old age, his food is almost the same.

The splendid effects of such diet are seen in the results to this race: thin, wiry, capable of endurance, cool in body, ever able to sleep and work under a burning sun.

But is his diet altogether perfect? I mean, of

course, where his poverty does not prevent his obtaining good supplies of his accustomed food.

When we see men of great, and all ages, women and children, down to infants, all thriving, and showing great capacity for work, and great regularity of the animal functions on its use, one is slow to dissent from its great value, and from a conviction of its nearness to perfection, and admires and learns that the early instincts, reason, and mind of man, have developed almost the highest knowledge on the grand question of human food. But there opens out the very important question, how far long centuries of such simplicity and sameness of food (amongst other causes) may have been the antecedent course of that stream or rate of the life or vital power of the native, which now shows its natural and necessary parts in his tendency to diarrhœa, dysentery, cholera, &c. It is a most interesting and arresting contemplation, that just as we in England tend to cease the individual life, throughout a great part of the race of human animals, in the direction or in the "form" of tubercle, or in the ending of part of our being—the ring, or segment, &c., or "form" of which the molar-teeth are a nearly related part—or in the tendency to cancer-growth, be these from loss of balance, controlling power, or whatever else, or in those so-called fevers, inseparable parts of the rate of early life in the European animal, such as scarlatina, convulsions, measles, whooping-cough, &c.,

(and by no means exempt from those natural and of necessity tendencies in after-life, as scarlatina, typhus, small-pox, &c. ;) so the native of India tends to die in other rates or "forms ;" he dies very rapidly, and in the prime of life, showing symptoms and changes, such as ulcerations in the large intestines, rapid discharges from the intestines called cholera, or sometimes a sinking out of the heart's action, without any other prominent symptoms. I say it is a very interesting question how far his long-continued habits of spare, and sameness of eating, have contributed to such his physico-vital fatal tendency.

As I have before compared it, the native dies just as a September leaf falls ; fundamentally, it was neither this wind nor that which brought down the leaf, but its period had come, its life was passed, the elasticity, the vital power, was no more in it. So the native may die, whether we call his dying-picture cholera, fever, diarrhœa, dysentery, or syncope. Fundamentally and for a hope of prophylaxis and treatment, we must first view these as his at present (under all the circumstances) natural, and of necessity, tendencies and courses.

In allowing the mind to dwell on large, or wide, or general views, there is no occasion to lose sight of any clear and contained facts. A state (say cholera) into which races may fall and tend, may or may not give rise to creations of forces, poisons, &c., capable of infecting other men. But whilst

it is not only a legitimate inquiry for us, in our present ignorance, to seek any fact which may cause, *e.g.*, this disease, be it in water, air, clothes, electricity, &c., it is not less important to remember that cholera, in a large, historical point of view, shows itself, or rather that men show it, at periods whose rates and dates of returns are not yet clear to us, and that it may be, and is, in the very nature of individual life, and therefore of races, to show long periods of vigour and health, with associated (and equally of necessity) breaks in that course. The so-called disease is as true, and natural, and necessary a phenomenon as is the period of vigour. The actual progress in time, of inorganic or organic existences, or in human history, is not truly seen until we, with equal clearness, recognise the general course, the developmental directions, periods, and times, and the directions of ceasing. Of these latter (hypothetically) may be cholera, diarrhoea, dysentery, in the natives of India. It will be the glory of some one to see that want which the native's system does not get. Already the agriculturist supplies to the soil these wants which his failing plants need. The potato in Ireland, the vine in Madeira, had a cholera of some kind, and so the September leaf.

It is interesting to see, that in the management of growth and food of the vegetable kingdom, we are advancing in practical knowledge of Nature more easily than in the cultivation of the human

animal, and we may hope most for the latter, not from classified systems of study of disease, as from some observation of fact in the instincts and simple habits of native races.

That hope exists for a much higher vito-physical state of the native of India, all who know him nearly must feel. Without adopting some of the worst habits of Europeans, as is too often the case with his Christianity, a native may yet remain under the banner of an elevated Hindooism, and accept those of our offers which are rational and valuable. There would be no objection to the use of tea, coffee, or cocoa. I have found in general that those who have never tasted tea in their lives before, when once it is given to them, long and beg for it again. Nursing women, those recovering from long-continued diarrhœa, those reduced by frequent attacks of intermittent fever, and even young children, will long for tea, and entreat that it be given them.

It is well known that in Demerara there is a large mortality of Calcutta Coolies after arrival; that such is the desire to save money amongst them, and such the comparative expense of provisions there, that they stint themselves the real necessities of a life of labour. I think it not unlikely that if tea were issued on ship-board during the voyage, not only would immediate benefit to health accrue, but a capital habit might be formed, which would help to sustain the Coolie's life and

health in the trying climate and work of a British Guiana sugar-field.

But, however good tea, coffee, &c., may be, we yet long for nearer and more apt supplies to man's wants. However widely and ruthlessly cholera may appear amongst strong Western races, it is very important to remember, that it is ever present, and one may say, native or natural to the most physically feeble and spare-fed of the civilized races of men. And not only in contemplating cholera does the subject of diet in the wide aspect present itself, but in considering the diarrhœa and dysentery of the native, yet more strongly.

In viewing the so-called "diseases" of man, the largeness of the phenomena—as, for example, of a fever, &c., or the continued formation of tubercle, cancer, &c.—is liable to withdraw the mind from the fact, that these great and fatal results are but the tendency or rates of certain unknown states, or wants, or alterations in composition, and that in other instances we have happy experience that some single, most minute want, or absence or presence, is the compensating and essential cure, or supply, or restoration.

It is worth observing that the diet of the native is very much of articles in their complete and entire state; that the small amounts of the seeds, &c., of which he prepares his curry are in their raw and native state, husks and all. And further, with their essential oils or principles entire and unaltered;

just as tea, coffee, cocoa, &c. have an effect in sustaining the powers far beyond their mere bulk, &c.; there is little doubt that other simple foods, such as seeds, &c. have a very important place in the essentials of the "weak" diet of the native.

He has, amongst many other cravings on ship-board, a great longing for onions and garlic. When seeing, so often as I have, the Coolie's natural instinct for these articles, and also viewing with their use his physical system sustained, developed, and improved, my mind has questioned whether the chief food of the English, viz., bread, is not irrationally prepared, and whether the fine and sustaining qualities of the grain of wheat, may not be in some most essential respects destroyed or removed.

It is worthy of remembrance, that when the whole growth of any grain is consumed by some animals, as, *e.g.*, the horse, not only is almost perfect health the result, but perfect health with great powers of endurance or labour.

When one sees the scrofula, the failure of vital formative force, the tendency to joint and cartilaginous affections so prevalent in Europe, whatever influences as producing such, may be justly ascribed to crowding of cities, absence of immediate vegetation, and open soil, absence of sun and light, &c., there yet remains a strong impression, that an artificial diet may be yet a more important source of the evil.

It would seem a most startling fact, that man should choose to remove from the grain of wheat some of its actual parts, and not only so, but to ferment or change the remainder. The flour eaten so largely by the up-country natives of India, is a coarse kind, and contains much of every part of the grain. He kneads with water and salt only, and it is at once cooked as a thin pancake.

That the natives of India, who have presented a civilization, with but little change of habits and diet for thousands of years, should yet remain in spite of poverty, fevers, climate, &c., so fine a race, is proof of the nearness of their diet and habits to the order of nature and man. On the other hand, the decay of the molars, the frequency of the failure or ending of the vital powers, in the tendency to death of cartilage and other parts, *e.g.*, lungs, of the European animal and race, point to some want; it may be small or even single, but most essential. Referring to the molars we can observe, that even in a generation or two an influence is seen in them,—those teeth in the country labourers, will be found more perfect than in the more wealthy middle classes.

I need scarcely add that in viewing any general deviation from health in the human race, such as the decay of molars, the cessation of the formation of normal lung tissue, the early cessation of vital power in the cartilaginous system or parts; that all such, are affections of the whole body—and

that such take place of fixed and necessary order, and consequence and rate, though happily the restorative supply may yet be found in a very small compass.

We are apt to forget, in the silent and (by comparison with individual daily experience) slow course of animal life, and the human race, that the most common habits may be the causes of the greatest results and phenomena in health and disease; and without ascribing too great a perfection to the diet and habits of the East Indian, I think that a comparison of their philosophy in this direction with our own, will impress us with our great faults and errors.

IV.—CALCUTTA COOLIE EMIGRANTS' WATER.

Water on ship-board and disease.—It is a fact highly interesting to the mind, that often when a ship sails with emigrants, native to Great Britain, Ireland, or Calcutta, that within, perhaps, a day or two, or a few weeks or more, life ceases in many of such people. No instance more “glaring” can be found of the great dependency, of health and life in man, on the physical conditions and existences, to which he has been habituated; no instance contains a more promising opportunity of inquiry and light; for the sources of error of fact and judgment are fewer than can but seldom exist, on shore, amongst larger and mixing communities.

Into an analysis of known or possible changes of relations and existences, which such a removal from shore to sea may contain, I cannot attempt to enter, but simply detail some facts and inferences, on the real or supposed influences which a changed drinking water may produce.

Referring to Calcutta Coolie emigrant ships, amongst the chief facts of the disease and mortality are cholera, diarrhœa, dysentery, fever, &c. The

mind was naturally apt to seek some immediate appreciable and very apparent "cause." Nothing was so near and seemingly natural, as to rest the thought, on something that was eaten or drunk. Hence, just as the Board of Health, in 1849, considered vegetables and fruits as "causing" cholera, so in India, many have felt convinced that the use of the River Hooghly water, was a chief source of the outbreaks of cholera in emigrant ships.

Viewing the question *à priori*, it would seem equally rational or irrational, or, at any rate, parallel, to deny the influences of external associated circumstances, such as water, vegetables, &c., as to conclude or assert positively to their powers. The medical man is less liable than the public, to hold positive opinions on such difficult and complex questions, as are those of the nearer facts of the outbreak of disease, yet our minds, perhaps, are of a habit too much of the same method. It is very pleasant, it is a source of happiness, one with our nature, to rest the mind on some very prominent and associated circumstance as a "cause." When, on sailing from Calcutta, an outbreak of cholera or diarrhœa happens, it is not wholly irrational that the mind should contemplate along with it, the dirty river water, which has been drunk. It would be as faulty in the inquirer, to omit such comparison, as it would be, in another direction, to conclude from such a coincidence, an actual cause and effect.

It is evident that the cholera, diarrhœa, fever, &c., are the natural and necessary tendency of the system of the native. The influences, or facts, or "existences," creating this tendency, or rather which are part of this tendency, may have been of ages of food, clime, &c.; or, even it may be, that the end of certain forces or states of development (or lines of being) with which the body is one with all force and life, has arrived in the race.

But whatever ideas we may have, or relations see, whether based on distant views of race and animal type, or on influences of food, clime, &c., the fact is clear, that the native of India has a strong tendency to death in certain directions, and which are conveniently described by us, as cholera, fever, diarrhœa, dysentery, &c.

These phenomena are his natural rate (under all the circumstances), as are the "eruptive fevers" to European childhood; or as are the periods of tubercle, or cancer cell, in the natural history of certain individuals of the human race.

I take it, that whether in medical or physical, or historical questions, one's first effort should be to see what is, to attempt to see (and see only yet) the whole that is possible, or to be seen, and thus to correct that habit of the mind, to form wide judgments, where only we can view a very few distant and obscure facts.

But this sudden outburst of cholera, or this prevalence of diarrhœa or dysentery, coincident

with the change from his native and accustomed home and soil, and all, to the sea, must have a chief and determining cause somewhere, and it is easier and pleasanter to rest one's thoughts on the river water as its cause, than to hold the view fretted and tormented by the varied (and, to our weak view, apparently changing) aspects which so vast and obscure a subject presents.

Amongst the principal deviations from his normal state of health, which the Coolie will show, after being launched from his native habitat, to the sea, are intermittent fevers, cholera, diarrhœa, dysentery, &c. Many who think it reasonable to ascribe his cholera, diarrhœa, and dysentery to the use of the river water, would arrest their assent to the decision that their intermittent fevers depended on it. Yet it would seem that all these varied phenomena are equally his natural tendencies, one at one time, another at another (in periods and under influences not yet known), and that the depression of his system, be it of its heat, or whatever else, of which are known so little, but which may be properly enough, yet hypothetically, called "vital powers," is equally the necessary antecedent of a cholera, fever, diarrhœa, &c.

We yet know of no exact differences, in the circumstances or facts, which, in the native's system, or in its relations to external physical states, when it may be about to cease its normal rate of health into that of the symptoms called cholera,

or those called intermittent fever, diarrhœa, bronchitis; nor, *à priori*, should one look for much, or any difference, although, to superficial observation, these so-called diseases appear so different.

In Calcutta Coolie emigrant ships three kinds of water are put aboard—viz., the “distilled aërated,” of Dr. Normandy’s apparatus; “Tank-square” water, which is that of Hooghly, filtered and pumped into a pond or lake in the middle of the city; and the river Hooghly water pumped direct from the river through filter boats.

In four voyages from Calcutta, the Hooghly water has been given without any case of cholera.

The diarrhœa which had (as the table shows) been prevalent in the earlier weeks of the voyage, was coincident with the first days at sea.

Distilled water cannot be issued in the river.

The Coolies use three or four times the allowance at least, when in the river; there must be no stint.

Nor *à priori*, should I have expected that the river Hooghly water as it flows in its natural course, would be deleterious to the Coolie or productive of dysentery. I do not here refer to the brackish water which the Coolies are apt to draw, but to the Hooghly water put on board in casks or tanks. It is true that such water, especially when kept in casks, is certain to generate noxious gases; but this does not, as far as I have observed, occur up to the time of sailing.

At any rate it is worthy of note, that a vast

number of ships, with Coolies, have sailed down the Hooghly, and used its water without injury or disease.

The Coolies have been accustomed to the Ganges water, to an extent far beyond any other. The same water which they have, from all parts, been accustomed to drink, cannot be obtained; but none so nearly fulfils this as that of the river, or better perhaps still, from the Tank-square, which is a cleaned pond of the river water.

The pretty theories which medical men, &c., form, and even lay down as true, on the dirtiness of the Hooghly, &c., and on its bad influence on health, &c., are, no doubt, worthy of attention; but much positive assertion, on pure supposition of facts is prevalent.

We are very much in the first awakening of the human mind to these matters, and with little or no actual knowledge, pronounce very positively.

The customs, judgments, or habits of men, such as natives of India, are safer guides than the dicta of the early and positive periods of superficial science.

I doubt much if a safer water than that of the river Hooghly (as shipped in Calcutta) can be given to the Coolie, either in the river or out of it.

Philosophically it is very interesting to embrace in one view the active, mental working of man, each in his small direction on the mountain of truth—each positive and confident.

Thus the outcry against the foul Hooghly will

end in good, but in the meantime much too positive statement is made.

Has any man yet known a case of cholera produced by Calcutta water? Probably no one would venture to attempt to establish such a case. To prove one case, or even to afford rational and logical evidence of such, would be a work of much labour.

The people of great cities and countries, during long centuries have buried their dead in, and drank of, this water. These rivers have carried down enormous *débris* of great countries. Cholera, diarrhœa, and dysentery have held on their own courses, profound in the very nature of matter, "forms," and man. That in a full inquiry into the nature of these diseases, the water drunk will form one point in the entire study (and it may be a very important one) is true; but it is an instance of the most early use of the undeveloped human mind and reason, to ASSERT the influence of this water as a cause.

The following statement may be made in reference to this ship:—that Calcutta river water was used in the Hooghly without results, which might cast doubt on its wholesomeness.

That it was used equally with the distilled, for drinking, throughout the passage.

That the same persons one day drank distilled, and next day Calcutta or Cape, throughout the passage, and that no evil result was traced in any instance.

That the Calcutta and Cape waters, were always used for cooking.

That thus a very mixed kind of water was served for drinking—viz., Distilled, Calcutta, and Cape; and that no injury or change in the number or type of cases occurred.

That Tank-square water (which is of the river Hooghly) came out of the casks much cleaner than the Calcutta river water. It is probable that the river filter-boats, through which much of our water was pumped direct from the river into the ship, are very dirty and inadequately built for the purpose.

That the Calcutta river water in casks on board, becomes very stinking, and unfit for use for drinking; it was never served for drinking direct from the casks, but always pumped first from them into iron tanks, where it was allowed to remain from a day to a week, before being issued for drinking, after which it was sweet and wholesome.

In a case in a former voyage, where stinking Calcutta river or Tank-square water was issued direct from a cask for drinking, and when 27 days from the Sand-heads, a case undistinguishable from cholera occurred; no cholera having happened in this ship before. But 300 Coolies on this occasion drank this water, with the one case only of cholera resulting. That further, when on another voyage, distilled water for drinking, during many weeks, had been without exception issued, we, on leav-

ing St. Helena, issued its water; a general increase of diarrhœa and cramps in the abdomen occurred.

I set much value in having a large tank (say 1,200 gallons) on board, into which Calcutta stinking cask water, can be pumped in readiness for issue for drinking, if only for its value in making the water sweet; but it is probable that the use of stinking cask water, would be followed by bowel complaints—cholera, diarrhœa, dysentery, &c. The knocking out of the bung of the cask, a few days before issue, does not suffice to get rid of the stink.

Very anxious not to change the drinking water of the Coolies on the voyage—we have not been able to attain this with Normandy's machine. The subject of the uses of different waters by men, is full of interest, relative to the changes from health to disease, but it is of great importance not to be carried away by vulgar notions, or to be misled by apparently "positive instances."

Light and truth will open up some day, if we proceed firmly and slowly, holding each step in abeyance, until we see the gleam reappear.

V.—VARIED TYPES OF DISEASE ON SHIP-BOARD.

It is convenient to use the words, “Varied Types of Disease,” as, *e.g.*, when the human body, in those its phenomena and changes, which we call scarlatina, shows great variety of symptoms, in the cases of different individuals.

An apology is needed for using the word “disease.” It is not meant by it, to convey that scarlatina is a distinct existence or thing which shows itself in different degrees, and in different parts of the human body. This would be to pronounce on what is yet unknown, as a fact established. But the word “disease” is convenient, and safe only, when the mind remembers that its legitimate use is that of a hypothetical term, used to signify those contained deviations in the natural and necessary rate of the vital progress and facts of the human system, from the normal rate of health.

It is a dangerous word without this careful and continual remembrance, and becomes the more so, when any of these varieties or changes in the natural course of life and health, presenting a similarity of aspect and nature, receive, from the necessities of description and recognition, a distinctive name.

Thus, whilst it is absolutely unavoidable, but that we speak of scarlatina, measles, &c., as distinct and different "diseases," it is not less important to remember that they are more alike than different. Or to take another example, that the slight "cold" which in an English clime, men who are just off a long sea voyage suffer, during the first ten days of shore life, is of a parallel course with the remittent or intermittent fever, which, under somewhat similar circumstances, occurs often in tropical latitudes.

However different in results, in the insignificance of one toward danger to life, may be the two cases, they appear to be, fundamentally, deviations in the same direction, phenomena absolutely parallel.

If such ideas be apt to nature, the mind is removed from the search after specific and miasmatic poisons, &c., to a wide and general view of man and his infinitely exact, coexistent, and oneness of relation with, and partship of all nature.

Although such methods of viewing disease and man are only preliminary to exact inquiry and facts in the end, yet they may aid to keep one's capacity for observation open and impressionable to whatever is true and simple, and guard one, in viewing phenomena, against the danger of estimating facts more by their influences, striking effects, and personal results, rather than by their exact place in nature and truth.

I propose to refer to some varieties in type, or rather to describe some phenomena which the human body showed, and which are of an appearance like to those, which in their great and distinctive prevalence in Europe, have received, for recognition's sake, distinctive names, as cholera, scarlatina, fever, inflammations, &c.

Sore Throat.—The iron ship *Accrington*, of 1,900 tons, sailed from Southampton in June, 1862, for Melbourne, with 43 men, 336 women, 27 boys, and 30 girls under 12 years of age.

The following is a weekly return of the cases of sore throat throughout the voyage.

	1st week.	2nd week.	3rd week.	4th week.	5th week.	6th week.
Dates	To June 11.	June 12 to June 18.	June 19 to June 25.	June 26 to July 2.	July 3 to July 9.	July 10 to July 16.
Places	Southampton and	Channel.	Tropics.	North Tropics.	Equator.	Passed south Tropic.
Sore Throat .....	...	...	1	3	...	7

	7th week.	8th week.	9th week.	10th week.	11th week.	12th week.
Dates	July 7 to July 23.	July 24 to July 30.	July 31 to Aug. 6.	Aug. 7 to Aug. 13.	Aug. 14 to Aug. 20.	Aug. 21 to Aug. 27.
Places .....	...	...	40° to 44° South Cape to St. Paul's.	40° S. to 44° S.	40° S.	Melbourne.
Sore Throat	2	...	17	19	27	5.

The ship's positions are noted approximatively.

Almost without exception the affections of the throat occurred in young and healthy single women. Thus there was a remarkable outbreak of sore throat soon after we had entered the relatively cold latitude of from 40° to 44° south, in July and August.

The change of temperature, to which the people had been subjected was from our English summer, to the passage of the tropics, varying in temperature from 74° to 86° , and at length to latitudes of 40° or 44° south, having a temperature from 50° to 60° . The temperature occasionally fell to 45° or 48° , but this was seldom. The winds during the six weeks of running down our easting, were much more than is usual, warm and northerly. There were fewer, than is common, of clear, cold, bright south-westerly days.

The ship was abundantly ventilated and well lighted; there were means for protecting the people from the great draughts of wind during the night, and at the same time of securing ample ventilation.

Such were some of the external physical conditions under which, and others, these people's bodies, naturally and of necessity, took on a rate and contained deviation, whose consequences or most prominent symptoms, were the intensely inflamed, swollen, and painful tonsils.

The general courses of the cases were alike.

At my morning visit, the girl would say that she had noticed no change in her health until the previous evening, when a severe shivering had come on, followed during the night by great heat of body and sore throat. On examination I should find the pulse fast, skin hot, tonsils red, swollen, and thickly studded with dirty whitish specks. By the second evening, in almost all cases, heat, fast pulse, and pain had disappeared, and the patient was passing again rapidly to health.

Out of a record of more than 40 cases, there was one only, which did not thus rapidly restore its normal state. Of this one, on the 7th day of the attack, "Morrish, M., 17 years, fauces natural colour, few spots on tonsils; is pale, weak, sweats on nose and upper lip; pulse 120; pain in abdomen, aching of limbs, tongue soft, large, tremulous."

It is interesting to note that in this outbreak of epidemic sore throat, it was the human animal at its age of from 17 to 21, which so much and in such direction deviated. One cannot help expecting, that some day the philosophical anatomist may be aided in unfolding the at present obscure history of animal development, by facts of deviation (disease) of rate of parts of the human body, at certain ages; or perhaps the physician will look mainly to the philosophical anatomist for his hope of the actual basis on which his system of disease, if it be made embracing and true, must be built.

The history of any one such case of sore throat, fully told and understood, would be a vast light in the natural history of man; but in the meantime, conscious of our ignorance, one can only seek to see truthfully that which *is*, and thus not having yet felt the "illuminating idea," avoid at least presumptuous theories.

The general and recognised outward facts of one such case, were shivering, heat, high action of heart, loss of powers or tissue of some of the structures of the body.

The general course was thus parallel or analogous to any other so-called fever, be it an infantile, intermittent, continued, variola, erysipelas, or pneumonia; or as before stated, to what is called a "common cold."

However different in result to individual life, may be these varieties of states or diseases, and however necessary to perceive their great differences, it appears not in the least degree less important, to remember their oneness of type and deviation, and their further oneness in fundamental facts of nature, with the normal rates or "forms" of the human body, in its widest relation to all existences.

Thus arises the intense hope of prophylaxis and cure, by the analogy suggested by arsenic, quinine, vaccine virus, &c. &c. &c.

Two years and a half before the present voyage, this ship had had severe scarlatina on board

amongst the soldiers' families, in a voyage from England to Calcutta.

What treatment was I called on to pursue in these cases of sore throat?

I know of no substance, which when given would supply to the human system these powers or states, which would balance the vital conditions, or make them to be such, that it would be impossible for that first act or loss, or whatever it may be, to happen, which is of necessity followed, at the ages and under the circumstances of these people, by painful inflammatory action of the tonsils.

In the order of these phenomena, whatever that first act, state, or change may have been, one longs for that perhaps, single element of supply, whose absence is the necessary passage of the body to such a state of system and tonsils.

This, looking forward to some "specific," as it is improperly called, has perhaps some part of its explanation, in the fact, that we see the body through the great proportion of the time of an individual's life, and further, throughout successive generations and races, maintaining its health; the change or passage to different diseases is the infrequent exception, and all this, under the circumstances of the great risks which human intelligence makes for us in departing, in some of the essentials of physical life, from the true animal instincts and necessities. Thus we are naturally and easily led to hope, that many of our diseases may be the

natural and sad necessity of some slowly-acting want or absence or disturbed relation, and thus also our hope of restoring such, by what are improperly called "specifics."

Just as the use of the word "diseases," and the perfectioning of nosological classification, have had their bad influences, in closing in the range of mental vision from the infinite breadth and beauty of the relation of man to the whole of existences; so the word "specific" has even a more dangerous influence on our minds, unless it be well remembered, that it can be justly used—but in a hypothetical descriptive sense, and temporarily only, until the instances which have given birth to the use of the term, are seen to merge, with our increasing knowledge, into the ordinary course of nature.

But in the cases of these young women, I know of no substances, which could give their systems those conditions which would render a change to sore throat, fever, &c., impossible. They had the best food and drink which was within reach, under the circumstances, of steerage ship-board passengers on a long voyage.

The marked commencement of the cases took place in the southern tropics (12° south), with the thermometer gradually falling, and with the greatly more tonic influences of the wind, when a ship is "braced up," than when sailing lazily before the wind. It is worth remarking, that with the great

bulk of Government emigrants, such is their physical and mental state, that after crossing the equator, and when exposed at all to tonic influences, they show a strong disposition to utter inaction; those in perfect health would, if allowed their own wills, scarcely move out of their beds to attend to the necessities of nature, or to the decent preparation of their food; but they soon recover some energy. It is worth observing, however, that the passage into disease with them is co-existent with the exhibition of the lower instincts of uncultivated animal nature.

I have before noted, that just as the native of India, when taken out to sea, and under the first influences of the tonic sea air and regimen, shows his body's natural tendency to fever, cholera, diarrhœa, dysentery, &c.; so we see the European animal, showing his, in the inflammatory sore throat, &c.; and who can doubt, although great variety in the colour or form of the phenomena in the two instances may exist (and which naturally and properly enough first catches the attention), but that the deeper nature of the two histories are one. And this view, not only puts us in the rational course of prevention, but is that which enables us to study on a method having hope for a discovery or perception toward cure.

But although cases showed themselves with the first depressing influences of the south-easterly trade wind, and the ship's relative position in

sailing, the great outbreak was in 40° to 44° south, when running eastward in the southern Indian Ocean. Here 63 new cases occurred in 21 days.

As my knowledge gave me no help toward the prevention of cases, and as nothing was attempted in this direction, save as far as possible, in giving good food, drink, due ventilation, but also much night protection, so did I feel ignorant of any treatment within the reach of medical art, which should have the power of altering in any way, the course of a case.

The usual warm-water vapour inhalation, external warm-water fomentations were used; strong tincture of iodine was painted externally. The two former seemed useful, the latter I could not judge as being of any value. As costiveness is the rule with emigrants, a dose of castor oil was generally given. Beyond this, no internal medicine was given in any case. All rapidly became well, save Morrish M., 17 years, who alone showed a continuance of symptoms of debility.

Quinine, wine, iron, soups, &c., were given to all after the acute symptoms were passed, which was on the second day after the first recognised shivering. They were carefully protected from night draught. Had the weather permitted, they would have been sent, when convalescent, daily into the upper deck sun and light and air, &c.

Was I justified in abstaining from all medical treatment? No one, of course, will conclude that

I was so, because of the recovery of all. But have we any actual knowledge in medical art. which should have been of more just weight in my practice, than on the other hand, was the conviction, that the diseased throats were a necessary and contained and secondary phenomenon of the human body, under all the circumstances, and that by simply aiming to conserve the vital powers (as far as known or supposed means were at hand) by warmth, rest, food, &c., I was doing all that was most useful, and that could be done (in the present state of our knowledge) for the benefit of my patients?

I was unable to conclude clearly that any result followed the use of quinine, iron, &c.

I may mention that sore throat is a common malady with European emigrants, on leaving the southern tropic for the cooler west wind latitudes.

Was this particular epidemic of sore throat—scarlatina?

Or what is the definition of scarlatina?

I cannot but think that we are apt to take too limited and positive a view of such a phenomenon, as what, *e.g.* we call scarlatina. We forget the vast, even infinite relations of man to the whole periods, matters (or existences) of the universe, and create the dicta of “specific” things—which after all, are only the narrow limits of our own “positive assertions.” It is wiser to merge ourselves, minds and all, into the vast whole of which

we in every respect are actual indivisible parts. We shall thus see and feel things in their true relations ; and such a phenomenon as scarlatina, will be cognizant to the mind as a natural variation of man's state in earlier individual life, at this period of time and nature—that it is not a specific thing, but a contained and natural and necessary variation. That it cannot be a fixed specific “disease,” because that as man himself is a transitional type and existence of matter and life, so the contained variations must be of the necessary order of his, at any time, then present actual age.

All questions of the contagiousness of one fever, and not of another, are secondary phenomena, to be known by experience alone. The greater subject, of the passage of the body into these rates, must be clearly seen, as placing the mind in a right light for receiving the actually existing, and open to us, yet not recognised, means of prevention and cure.

Continuous throughout the voyage, were cases of insidious bronchitis, affecting the smaller air tubes. On taking deep breath, small moist râles were heard at the lower and back parts of the lungs, but without noticeable dulness on percussion, or shortness of breath, when at rest. Such local changes were coincident with shivering, aching of limbs, general dulness of mind and energy, tremulous tongue, and some acceleration of pulse.

The weekly return of such cases was about as follows :—

1, 2, 3, 2, 3, 3, 3, 3, 4, 4, 0, 2.

Were they fever or bronchitis? But what is fever and what bronchitis fundamentally! Are they different in any degree, to compare with their analogous nature, origin, and potential causes? Were these cases of (call it “bronchitic colds”) of one primary course with the sore throat cases? Were the differences between these “colds” and the “sore throat” small, and their oneness very great?

I have seldom gone a voyage without seeing cases of “bronchitis,” with these symptoms of general malaise. In some ships they have gone on to frequent fatal results, in others no further than a common “cold.”

In the ship *Star of the South* many young people died. The cases during the earlier weeks of the voyage presented only a small amount of small cre-pitation at the lower and back part of the lungs. The patient would be indisposed some days, but rarely confined to bed. As the voyage progressed, cases assumed a more serious aspect; the simple malaise had all the appearance of fever; many died. Tonics, stimulants, wines, soups, &c., warmth, air, were all used. The most numerous and worst cases, were in young men and women, who slept nearest to deck openings. This epidemic established in my mind the conviction that “fever” and “bronchitis”

were sometimes of one nature and order, and that the distinctions which their names convey, do not exist in nature. Many observations, and *à priori* considerations, have confirmed this idea.

In the ship *Star of the South* one fatal case of dysentery (with low fever) occurred in the person of a young and healthy Irishman; but the general tendency of the people, was to effusion in the smaller bronchi.

As noted in the ship *Accrington*, the great local phenomena, were in the tonsils; many, however, had the malaise, with slight bronchitis.

Many varieties of course and symptoms of such "colds" and "fever" may be observed, and of which I shall add some other instances.

Just as the study of the outward aspect of the deviations of the human body, leads one to an opinion of their greater resemblances than differences; so there can be little doubt that the advancing knowledge of chemico-vital changes and physiological discoveries of analogies in animal growth, will open up harmonies and relations in events or changes, such as sore throat, bronchitis, fevers, cholera, &c.

I cannot but have been impressed with the facts that whilst East Indian natives, when taken out to sea, tend to show, under the first shock or depression, their system's direction of failure, in their dysentery, diarrhœa, cholera; so Europeans show theirs in the deviation or "form," or order

of insidious lung changes, bronchitis, fever, sore throat; in each case, so marked a general aspect of likeness, must be of the general necessitous order of the development and parts of the human system; further, the two (however different in aspect the phenomena may appear) are of one order and nature in fundamental origin, course, and relation.

Occurring throughout the voyage were cases, to which no name in particular, can be given. I have entered them as "colds." Their weekly numbers were—

1 | — | — | 3 | — | 1 | — | 3 | 10 | 2 | — | 1

The symptoms in these cases were sometimes well marked shivering, followed by a little lassitude, or an aching of limbs; in others the aching of limbs and general dulness, coming on without a marked shivering, would hang about the patient several days.

A dose or two of quinine would be administered, and wine given for a few weeks.

I suppose it is not unphilosophical to class such cases as of one type, analogous course, and nature, with the more fatal fevers of this country.

The mind arrested and almost staggered by the great dangers, and distinctive features of a typhoid or typhus fever, &c., may well, in its first efforts, learn to rest itself in some specific poison, or cause.

Were such poison or "cause" verified, it would

yet be, but one antecedent fact in the history of the course of the physiological or pathological possibilities of the human system; and one may be pardoned for thinking, that the direct search after hypothetical poisons, or germs of specific diseases, (as in typhoid, typhus, small-pox, measles, &c.), is a somewhat vain one, as withdrawing the mind from the simple observation of the laws or rules or rates of the actions of the human system, from which alone a wide, and justly apt to nature, and simple, and true pathology can be drawn. And not only so, but that such a search, is not a little an instance, of that stage of the imperfect development of the human mind, toward a true method, when its desires, or almost instincts for positiveness (the result of individual assertion) have not yet given place to that abeyance and "humility of pretension," which a simple and wider view of nature creates.

VI.—SHIP “ADAMANT,” AND FIRST RECOGNISED PASSAGE TO FEVER, &c.

IN striving to arrive at a true perception and knowledge of the relation which such a class of symptoms, as are those we call scarlatina, &c., have to the human system (and which are of necessity of the contained rate and order of the normal state of health), we find varieties in its forms, whether great or slight—these must be eagerly accepted as essential and true parts of the whole natural history of man; and even it may be, that such less striking phenomena (whilst it is absolutely essential to view them, in any hope we may have, of attaining to light and knowledge) are of a kind, more liable to instruct us, than the more frequent phenomena of any such disease.

Under such impressions, I think it may be worth recording the appearances of scarlatina in another voyage—viz., in the iron ship *Adamant*, 812 tons, Plymouth to Adelaide, in July, August, and September, 1863. See Table, page 126.

This ship had, in the preceding year, brought troops from Calcutta to England; but, as far as I can learn, had never any epidemic disease on board.

There were in a crowded community, containing 89 children under 12 years, and about 200 young men and women, only 13 cases of well marked scarlatina.

I have placed two lines, containing the total number of other cases, having apparently allied kinds of symptoms—viz., those of "ulcers of tonsils," amounting to 8 cases, and those of simple redness of tonsils, 15 cases. Nor would it be right to omit, the comparative statement of a number of cases of diarrhœa, which showed throughout the voyage, often and especially towards the end; first made known to the patient, equally with the throat cases, by shivering, general lassitude, and aching of limbs. One can see no reason why a set of symptoms made apparent to us, by disturbed abdominal functions, may not have been very much of a common type, origin, and course, with those which affected the tonsils, and with those others, which were the so-called undoubted cases of scarlatina.

There is also added a list of the total cases of hooping-cough. The return of cases, which I have entered as febricula or "colds" is not the least interesting.

Strongly impressed as I am with the thought, that the classification into differently named and distinct diseases, which the human body shows, however useful for purposes of description, is apt to hinder and indispose the mind to the simple,

Ship "ADAMANT."

Dates	Week ending July 7.	Week ending July 14.	Week ending July 21.	Week ending July 28.	Week ending Aug. 4.	Week ending Aug. 11.	Week ending Aug. 18.	Week ending Aug. 25.	Week ending Sep. 1.	Week ending Sep. 8.	Week ending Sep. 15.	Week ending Sep. 22.
Places.....	Plymouth to Fenistère.	To Madeira.	To Tropic.	To N.	To S.	To S.	To S.	To S. 40° 6° E.	To S. 42° 46° E.	To S. 43° 65° E.	To S. 40° 105° E.	To Adelaide.
Scarlatina .....	...	1	1	...	...	3	3	2	1	1	...	1
Redness of, and Ul- cers of, Tonsils }	...	...	5	...	...	...	...	3	...	...	...	...
Simple redness of Tonsils .....	...	...	...	...	...	...	4	3	3 very slight.	2	3	...
Hooping-cough	1	...	2	...	...	...	2	2	1	...	...	...
Diarrhoea	3	4	1	5	16	6	4	4	5	3	9	12
"Colds" or Febricula	2	3	2	5	...	1	4	...	1	2	1	...

obvious, apparent, and true aspects of nature, I am arrested at once by the significance of these slighter cases of "colds," and which appear to me to present the most hopeful field of our observation, and the formation of right ideas and thoughts.

Without venturing into speculative thought, I will note some peculiarities of the different phenomena which the *Adamant's* people exhibited:—

Of the 13 cases of scarlatina—

4 occurred in one family.

3 „ in another.

2 „ in another.

4 „ in 4 different families.

Of these 13 cases, marked as scarlatina, the first occurred 8 days after embarkation, being the 5th day at sea, when off Finistere. Boy, aged 7 years, July 8th, showed a copious, rough, elevated eruption on outside of arms; on the 12th, swelling of submaxillary glands. For five days prior to this eruption, he had been suffering from a very extensive scalp wound, and although it may be only a coincidence, yet it is not a little interesting to observe, that the first case of scarlatina in people who had been under observation, in depôt and on board, during a period of 12 days, without having any sign of this disease, was in that individual whose balance of system had been disturbed by the shock or changes coincident and consequent on a severe wound.

Nor do I conceive it to be an unreasonable or

vain question to ask myself—Are there any fair *à priori* grounds, or any open analogies, which might justly allow me to consider whether, had not the wound happened, should we have been free from scarlatina.

I have shown in the table the varied forms or directions of symptoms, which this community of individuals tended to.

The proneness to scarlatina, measles, &c., is a part of early life in our race, and at this period. Many circumstances appear to give occasion for the system to pass into such a state of vital action and symptoms. We have not recognised many of these, but broadly, they may be stated to be contained in circumstances, which form part of the changing seasons relatively to man. One such circumstance is involved in a change to the sea. It is very general with English emigrants, to have scarlatina, measles, whooping-cough, fevers, febrile pneumonias, and bronchitis, &c., &c., on ship-board; or in other words, these natural states, and parts and tendencies of the human animal life, show out of necessity, when his habitat (whatever this may contain) is changed from the shore to the sea. I have sufficiently alluded to the same order of change and circumstance, when the Calcutta Coolie is taken to sea: he passes into slightly different symptoms—cholera, fever, dysentery, &c.

Each people, however, take an allied and like action, let the apparent symptoms be ever so different.

That such varied forms, having been the *actual ones* (and in a community isolated), they must be taken as a true expression of facts and phenomena of nature, in its natural and necessitous course; but in the first general stage of the mind's inquiry, it is the most difficult of all efforts, to see things really *as they are*.

And without venturing to enter, or even approach, the subject of what these conditions are, which in the relation of man to the whole physical existences and infinite parts of the universe, of which he is an active, essential, and reciprocal physical part, and which have some of their most involved states, on these occasions, when his system has taken on those rates called fevers (such as cholera, typhoid, typhus, pleuropneumonia, &c.), I will try to hold the mind attached and in true apposition to facts, so far only as we have yet seen, and thus to view, at present, scarlet fever as an accelerated or altered rate of deviation of natural states or order; and before venturing to assert on it, and other allied phenomena, by the conjectural and mentally closing assumptions of "poisons" (the use of which word tends much to close the mind against true views and inquiry), learn rather in the present stage of our knowledge, to look calmly and see simply, that which really is; it may be, as most truly shown in the aspects and rates conveyed in the Table.

It is almost as justifiable to assert that we should

have had no scarlatina, but for the case of scalp wound, as to speak of a scarlatina "poison." Both such forms of expression would be highly wrong; both are beyond our actual knowledge; but the latter has this greater evil: that it is a *general* statement, and thus has its powers of captivating and closing the mind, it may be with great involved errors.

Nor does the occurrence of four cases in one family make justification for the use of the word "poison," unless, indeed, this word be accepted in an utterly new sense, from its original application and general present acceptation, and be made to mean all possible known and unknown physically altered relations of man to the universe.

That some state exists in an individual in scarlatina, capable of, and necessarily tending to extend or influence other individuals, is quite true; and that instances occur which in the present state of our knowledge, it is reasonable to hypothetically assume a *materies morbi*; but it ought not to be forgotten that such an assumption is for the most part hypothetical, and but a form of words, expressing our ignorance, rather than our knowledge of what the actual physical states of what is called contagion really are.

That four members of the same family had scarlatina, points, that such four individuals, to the first of those who showed the disease, were nearer to one state, one individuality and tendency, than

were to the first of those who showed the disease, other children of different parents and lines.

Scarlatina, &c., are not only to be looked at as things or diseases affecting individuals, but just as we see, from the young green of all the leaves of a tree in spring, to the drooping and yellow of these same in autumn; it is not that any disease or thing has struck them to sickness and yellowness; but this and all their other states, throughout their existence or period, are of the very actual rule of life of the tree, of the nature of vegetable growth, and of the whole universe itself.

By such a comparative view, applied to the altered or "diseased" phenomena of the human animal, may we hope to see where the delicately altered relation, or want, or whatever it may be, is.

Out of the thirteen, there were many varieties in the cases. Three had copious miliary eruptions; eight had the reddish eruption of scarlatina, but not of the most characteristic form; seven had sore throat, varying from the first to sixth day of attack; one single man, æt. 22, first showed low depression, aching of limbs, anxious countenance, with sore throat on first day, eruptions on fifth, and pleuro-pneumonia on tenth.

As has been often remarked, the experience of isolated communities, such as those on shipboard during several months, affords some of the most hopeful fields for actual observation and true ideas and views; and without in these notes, attempt-

ing an entire view of any subject, one may yet think that small, and what might appear common, or unsuggestive phenomena or facts, are yet those of the utmost place, in their power of enlightening the mind to the actual and existing truths of nature.

And in viewing the natural history of the people in the ship *Adamant*, it appears to be truthful to represent the exhibited facts of scarlatina, red tonsils, ulcers of tonsils, the diarrhœa, and the "colds," as so many varieties of one general and necessitous course of the vital and whole condition of the human animal; and it does further appear to me a most erroneous and dangerous method and system of description, at once to classify, so much as is done, closely and much-allied phenomena under distinct names or "diseases."

It is, in this instance, as true that the "colds" and diarrhœa were of one class of course and aspect and necessity, with the scarlatina, as that in some other experiences, what is called scarlatina is of a form or state which shows more markedly what are (and properly so, for description's sake only) called its characteristic symptoms. And, indeed, *à priori*, the mind is aware, that the phenomena of the human body and life, in their course, should first arrest our attention by the most glaring differences and colours of diseases, &c., and that thus we perceive and rest satisfied in the descriptive state of our knowledge, but also that we overlook, in this period of our intelligence (captivated by the

different colours we have attained to perceive) the vast oneness of system and order, and change, of which different so-called diseases are but slightly deviating and contained rates.

One need scarcely note, that there is a period in the human mind, both in individuals and in whole races, when it sees or feels *not wide truths*, when it holds to and believes that which it perceives as the full truth, and will not acknowledge even a possibility of aught further. This state has been very general in all times amongst a great part of mankind, who believed their own conceptions and ideas, to be the measure of the full truth. It is, as Herschel says, "by humility of pretension and confidence of hope" alone, that we can catch a ray of the whole light. This spirit is alike the parent of knowledge, joy, and all truth.

The bearing of such ideas, if true, must be of great weight both in method of thought and study, and immediately in reference to the treatment of such diseases.

As I have asked, in reference to the epidemic of sore throat in the ship *Accrington*, what treatment was to be pursued? I knew of none. I necessarily put aside all active measures.

The deviations of the natural rates must take their necessitous course, until the actual wants of the system, which were necessary antecedents and parts even, of these diseases, were known and could be supplied.

In reference to scarlatina, sore-throat, "colds," or the diarrhœa, no empirical and great discovery of any substance had been made, whose supply to the system, could restore the balance from that tendency to fall—however slight or slow its first movements—into the great disagreements and disparity of a scarlatina, or diarrhœa, or "cold," &c.

To keep the patients comfortably warm, with full supply of atmosphere without draught—to give quiet and rest, were first necessities. Encouragement was made to take soups, milk, and light farinaceous diet, but no food was withheld which the feelings or instinct sought; wine was given to most during many weeks after convalescence, and but seldom during the earlier days of any case. Had, however, symptoms of sinking shown in the earliest stages, wine and brandy would have been freely given.

Whatever be the chemico-vital action of alcohol in the human system (exalting, as it does, some of the powers of what we call the mind, soul, and senses), and in the absence of very clear or reliable knowledge of where and when it is truly valuable as a medicine, and further, in the absence of any power or knowledge on our parts as to how we can influence or treat for the patient's marked benefit such symptoms as scarlatina, I should not have hesitated to give alcohol in the earliest stages had symptoms known as lowness or collapse appeared. Acting on the idea, whether true or false, that

alcohol keeps up the vital powers, one would have administered it freely, both on account of immediate symptoms, and with the hope, that under its added powers, the system would be less likely to take on the low inflammatory, or congested and fatal affections of the lungs, which are often a part of the *rôle* exhibited by the human body in that direction or play of its course, which, usually commencing with a shivering or lassitude, or aching or soreness of body, ends at one time in scarlatina, at another in measles, at another in cholera, at another, in pneumonia, &c., but most often not passing to other states than that of the "cold." An occasional aperient of castor-oil or conf. sennæ were given when needed. A small daily dose of "bitters," of sulphate of iron, quinine, sulphuric acid, and infusion of quassia, at noon, was given to all, after the commencement of recovery.

VII.—PROPHYLACTIC TREATMENT OF SCARLATINA.

As much discussion had taken place, and as opinions were divided with the schools of the homœopathic flag, on the subject of the prophylactic powers of belladonna against scarlatina, I made some trial of it in the ship.

Excepting the crew, our numbers on board, and who all slept in the 'tween-decks, were 370, including 89 children under 12 years of age. Throughout the passage thirty-six cases, in all, of scarlet fever, ulcers of tonsils, red fauces, &c., occurred.

Of these thirty-six I made experiment relating to the fourteen marked in the table as undoubted scarlet fever, except Sparks' family, and occurring, as before stated, in seven families, viz. :—

			Patients' Ages.
Splains	4 cases	.....	11, 35, 16, 8.
Penny	2 „	.....	19, 13.
Ferguson.....	3 „	.....	7, 4, 1.
Hooper ..	1 „	.....	4.
Sparks.....	1 „	.....	8.
Hill	1 „	.....	5.
Hollingworth	1 „	.....	6.

The plan followed, was to give belladonna to the

other children, in families any member of which had shown scarlatina.

Penny.—F., 13, (of a family of children, of ages 19, 17, 15, 13, 10, 7,) showed scarlatina on August 14th. To two of the patient's sisters, æt. 7 and 10, was given belladonna from August 18th to September 19th. On August 23rd one of these showed sore throat. The other remained free from it. Of the other members of this family, a F., æt. 17, who took belladonna from August 17th to September 19th, on the latter date showed sore throat; tonsils both enlarged; red patches on anterior pillars; "skin cool." Another girl, æt. 15, who took no belladonna, showed sore throat and doubtful rash on August 16th. Another, who took no belladonna, M., æt. 19, had scarlet fever on September 3rd.

Sparks.—M., æt. 8 years (of a family of 8, 2, 1 years) had scarlatina on August 16th. To neither of the other children was belladonna given. Neither showed scarlatina in any form on board. Both had hooping-cough. The elder of these two sisters died on the 20th of October, after being about three weeks on shore, of scarlatina, with great swelling of submaxillary glands.

Ferguson.—(Family of three children, of ages 7, 4, 1 years). F., 7 years, and F., 4 years, showed scarlatina on August 6th and 7th. On August 18th, F., 1 year, commenced belladonna; on the 27th she showed scarlatina.

Giles.—(Family of three children, of ages 5, 3, and 1 years.) The child, æt. 5 years, showed scarlatina on August 15th. The two others took belladonna from August 16th to September 19th; neither had scarlatina. The younger had old hooping-cough.

Splain.—(A family of 35, 17, 16, 13, 11, 8, 6, 4 years.) Those of 11, 35, 16, and 8 years, had scarlatina on the dates of July 16th, 19th, and August 4th and 10th. The other members of this family, aged 13, 6, 4 years, took belladonna from August 13th to September 19th (excepting that one of four years, who ceased it on September 14th, there being dysentery). None showed scarlatina.

Hooper.—(A family of 11, 9, and 4 years.) The child 4 years showed scarlatina August 22nd. The 9 year old took belladonna from August 21st to 31st, when it was omitted on account of diarrhœa, and resumed from September 11th to 16th. The 11 year old took belladonna from August 21st to September 18th. Neither of these two showed scarlatina.

Hollingworth.—(A family of 9, 6, 1 years.) The 6 year old showed scarlatina on July 8th. The 9 year old (who took no belladonna) had scarlatina on July 18th. The 1 year old, who also took no belladonna, was free from all symptoms of scarlatina.

Out of the total of eighty-nine children on board

under 12 years of age, there were eight cases of scarlatina and six of sore throat.

Belladonna was given to eleven persons, two of whom subsequently showed scarlet fever and sore throat; but of the total fourteen cases of scarlatina or sore throat, six occurred before August 16th. Belladonna was commenced from August 13th to 16th. This leaves eight cases of the disease out of the eighty-nine children. As one of these showed scarlatina after belladonna, and as so few cases of the disease appeared among so many children, who used no prophylactic means, no comparative conclusion on the value of the remedy can be drawn. Although the opportunity appeared good, I found myself unable to make a nearer approach to a satisfactory experiment, nor could I venture to draw any conclusion, either for or against the value of belladonna.

It will be felt to be a fact of great import in studying the natural history of such an epidemic, that so many young children, in such a crowded community, remained free from this disease, or rather retained the normal rate of vital action. I should feel it to be an unwarrantable form of expression to say, that so many children, &c., "did not catch or take this disease."

But whatever forms of thought or expression the minds of different men may be natural with, the fact of such a non-occurrence of the symptoms of scarlatina, is as full of hope for our just views

and knowledge of the courses, conditions, and actions of the human animal life, as are the proved communicability in some instances of these symptoms or states. Nay more so, for the catching qualities of any disease, are secondary and subordinate facts, in the periods or times of this great course and order of natural vital action and rate, let it be never so important practically to individuals and toward the subject of isolation.

VIII. — SHIP “TARQUIN.” — ALLIANCES OF FEVERS, INFLAMMATIONS, CHOLERA, ETC.

I ADD here a table of another voyage in which scarlatina occurred; page 142.

The ship *Tarquin*, of 700 tons, left Plymouth in August, and arrived in Adelaide in December, 1864, having on board 62 married couples, 105 single men, 49 single women, 21 boys, 23 girls, and 13 infants.

The following table shows the force or tendency of these people to symptoms of scarlatina, &c.

In viewing the facts of the table, and anxious from them to see and know that which is, and to hold the mind free from all positiveness of opinion, beyond the open state of knowledge and doubt, which our imperfect perceptions make fit, one may venture so far to say, that it appears reasonable to view the scarlatina, the sore throat of various kinds, the “colds,” the bronchitis, and diarrhœa, as of *one* order, or rate, or direction of the course of the vital facts of the system, in its whole internal and external circumstances or parts.

This is not *proved* by the mere fact of association.

Ship "TARQUIN."

Weeks	1st Week.	2nd Week.	3rd Week.	4th Week.	5th Week.	6th Week.	7th Week.	8th Week.	9th Week.	10th Week.	11th Week.	12th Week.	13th Week.	14th Week.	15th Week.
Dates	Ending Aug. 27.	Ending Sept. 4.	Ending Sept. 11.	Ending Sept. 18.	Ending Sept. 25.	Ending Oct. 2.	Ending Oct. 9.	Ending Oct. 16.	Ending Oct. 23.	Ending Oct. 30.	Ending Nov. 6.	Ending Nov. 13.	Ending Nov. 20.	Ending Nov. 27.	Ending Dec. 4.
Places	Tropic	...	...	Equator.	...	Tropic	...	...	Cape	...	St. Paul's	...	120° E. 38° S.	Adelaide.
Scarlatina with Eruption.	2	1	...	...	...	1	1	1	1	...	...	...	...	...	...
Severe affection of tonsils, with severe general symptoms	1	...	...	...	1	...	1	...	1	...	...	...	...	...
Dirty brown tonsils, and severe general symptoms	1	...	...	...	...	...	...	...	...	2	...
Jagged tonsils; not severe general symptoms	2	...	1	...	...	...	1	1	1	...	...
White specks on tonsils; not severe general symptoms	1	...	...	...	...	...	3	...	...	...	...	...
Patchy back of pharynx	6	...	...	...	...	...	...	1
Red pillars and tonsils; swollen uvula	1	1	...	...	1	...	3	1	2	...
First, some form of sore throat; bronchitis following	1*	...	...	1*	...	...	...	2*	...	...	...
First, some form of sore throat; diarrhoea following	1*	...	...	...	...
"Aching bones;" "can't keep heat in me;" after shivering	2	...	...	3	2	...	...	8	...	1	2
These latter ending in bronchitis	2	2	...	...	4	...	...

* These cases of sore throat are included in the other classes.

But if the leading idea be true, that a likeness of order and rate, or type, belongs to all, then no distinctive, subordinate, or secondary quality, of one, such as the developed communicability of scarlatina and not of the "colds," should have an influence on the mind, which should make it lose sight of the great common type or course. This contagiousness becomes another fact, in an attempt at a whole view of the natural history of man's existences.

That these various cases are of one class, need scarcely be shown. In this epidemic, as in most others, what is called scarlatina, showed great differences in degrees, in localization, in period of duration of symptoms, yet, with all these varieties, the great features remained constant. To the descriptive tourist, the Grampians, the Alps, are different; to the philosophical geologist they not only have different appearances, but they are vastly more of one system and resemblance. And so much more in the varieties of severity in different cases of scarlatina, "colds," diarrhoea, bronchitis, &c., in different epidemics: *the grand oneness* of all the cases is *the great fact*. Yet in this oneness, this fundamental course, are great varieties, or rather degrees. Where is the limit in different cases, of an undoubted one, of scarlatina? What is the limit of vital action and change in any single case, the most simple, of scarlatina? Who can venture to state what is its fundamental and primary course,

its starting point in the body, and all? For we can never doubt but that the symptoms of this disease, are but the natural and necessary phenomena of necessitous action, consequent on some previous fundamentally changed relation — one might almost call them, symptoms of a curative or returning normal action.

Even in one family, one member shows malignant scarlatina (I am obliged to use these terms in describing), with eruption, sore throat, and long-continued brain symptoms; another has only shown sore throat; and another slight sore throat, with lassitude; and another with the slightest affection of throat, but with lassitude, shivering, aching of bones, &c.

If such varied appearances exist, where are we to draw the line of a specific difference between the most severe case, and the “cold” only?

They are undoubtedly the same, though varying in degrees; the expression of these degrees, is to be found in the contained and essential rates and necessitous order of the human body and all. And further, how can I but recognise that a low form of bronchitis, even often fatal, or a low form of diarrhœa, or even the symptoms of a scarlatina, a sore throat, each and all becoming frequent under the conditions of a voyage, in people of similar class, habits, and race, and having the same common and constant symptoms, are profoundly, but one aspect or course of the human system?

Or, to take an extreme illustration : Owen M., æt. 35 (September 27th, 6° south latitude), a fine, strong man, ate his dinner, and was well at 1 P.M. "Felt cold," got up from the table, but so weak he could hardly stand. At 8 P.M. : very weak, limbs have no strength, and fauces reddish ; one greyish white spot on the left tonsil, one-tenth of an inch in diameter. This man continued ill, weak, and low, until the 2nd of October, when he slept and sweated, and said he was much better.

How like an attack of cholera ! True, the apparent symptoms vary in the two cases, but the resemblances are greater than the differences. Such is the course, such are the parts and necessitous courses of the human system, that the ever-progressing, evolving rate of life, has its changes or feeble periods in the individual, and symptoms known as cholera, sore-throat, fever, &c., are for certain periods the necessary results. For is not the great fact open, that the human system and life, in some parts of the globe have a tendency to those known as cholera, and in others, to those known as inflammations, and fevers, and sore-throats, &c. ? To fail to see the oneness of the profound nature, of these varied phenomena (and therefore to lose the method of hope towards prevention) appears to me as strange, as that now past difficulty, which men had in feeling, that differences of colour, language, and institutions were but very

inconsiderable varieties, of a common oneness of all of these subjects.

I can no more doubt but that cholera, as easy and ready to the native of Bengal, and inflammation and fevers, as easy and ready to, or necessitous, to the European, are both of one course, than I can doubt but that our languages, races, philosophy and faith here, are vastly more related to, than different from theirs.

The occasional "instance" of one of such people, and country, and race, taking on, and showing out the symptoms more common to the other, is somewhat akin to a crucial experiment, proving that these courses, diseases, and symptoms (cholera) most common to man on one part of the earth's surface, are the same as those (fevers, inflammations, &c.) apparently so different, which man mostly shows in another part of the earth. Not only does the table of cases in the ship *Tarquin* show all the variety in the sore-throat, from the most simple to diphtheria and severe scarlatina, but toward the end of the passage the type of sore-throat became mild, though the cases were as numerous as before, and further, the cases of "colds" without any special recognised local affection became more numerous.

Such a series of phenomena, which this associated community presented, must be taken as a *true expression* of facts of Nature's course.

Then, forgetting the old guess at some "poisons"

infecting these people, let us simply view the phenomena as they are presented, in all their actual variety, as a true view of a spot in the vast field of the natural history of man and all.

Viewing this varied course of symptoms or diseases, having one common base, origin, and course, the mind asks itself, if any other parallel histories occur in the appearances of some forms of remittent or intermittent fevers and cholera—*e.g.*: A man, æt. 30, at 7 P.M., by chance, for half an hour, after dinner, fell asleep on the poop of a ship under awning in the River Hooghly, in October.

Having been previously in perfect health, he awakes with marked pains in two symmetrical points in the forehead; a slight shivering follows, and for seven days he is low, weak, sleepless, and without appetite.

He is so weak as to be scarcely able to crawl up or down stairs. At 2 P.M., on October 2nd, helped into the cab, he drives to quarters, the one-eighth of a mile from the ship; at 6 P.M., he is quite well, cheerful, and goes into dinner with relish.

One can often date thus, the first unknown essential act or conditions of acute disease. In this case there was a general *malaise* like fever; but it was not any specific fever, any more than it was specific cholera. It was nearer in symptoms to fever than cholera.

However near to each or both, it was not the

most distinctive course of either. We cannot, however, doubt the presumption, that whether cholera, or remittent fever, or intermittent fever, or dysentery are the rates of vital action after such-like commencement, that not only is the course of all and each apparently like, but actually so, and one even, in the grand facts of development, origin, and even in their very nature, as related to the actions and life of the human body.

The differences which we recognise in cholera, remittent fever, dysentery, &c., however important and true, are yet probably subordinate, secondary, and of little value, toward hope in suggesting prophylaxis or treatment. The law, or order, or course of the human animal, is not only that of the steady constant rule of life, which we call health, but also, the equally existent tendency to directions, which here, is in the fevers of childhood and manhood, the rheumatic and inflammatory affections, and there, in the diarrhœa, choleras; the difference in the two classes, philosophically speaking, is small indeed.

One might almost state the matter as a proposition: As the diseases of any region and race, are to those people—using the word race in the widest possible sense, as including the immense periods and slowly-acting physical and all existences, which have produced, or rather, which are one with, and of, these differences of the human beings—so are

the diseases of man in all different regions, &c., to their external and entire physical associations and periods; and this in exact and necessitous proportion and true partship. And as we now feel, that these varieties in being, whether of plants, trees, animals, and man, are of the order and necessity of great periods, and of the necessitous and contained order of time and development, so may we view these phenomena, so often described as different diseases, as of one allied order, and as so many subordinate proportions, having their true historical periods, and as having originated, or shown out, in man and all; and as varying, and passing along, doubtless to other apparent forms (which perhaps physicians may cease some day to describe, and state as specific diseases, but rather view as varying and changing shades of common course); and as the differences of race are but so small, so almost infinitely less in time and degree, than are the great identities and oneness of being, so proportionally small also are the differences in the nature of their rates, deviations, and diseases. A case of cholera and a case of scarlet fever, appear very different diseases, and no doubt are so; but it is not less important, but I believe greatly more so, toward a true and happy knowledge, and even toward a hope of treatment, to feel that they are vastly more one, than two.

If these considerations were fully proved or not, the mind still would have no difficulty in accepting

any facts which presented in the nature of any such disease. Cases might be infecting or not; experience or facts would show this. The contagiousness, or otherwise, of scarlatina, or cholera, &c., are secondary facts in the natural history of the great course or forms of vital deviation.

IX.—CHOLERA, QUESTIONS ON.

As it is probable that in September next, I may take charge of a Calcutta Coolie emigrant ship, with 400 natives, I ask myself the question—What management and treatment ought I to pursue should cholera appear amongst them? Am I justified in concluding, that this malady has hitherto been wholly uninfluenced by any of the means of treatment used? I fear that this is the case. Should, as is common, the outbreak of well-marked cholera, go along in many others of the people, with a milder type or degree known as choleraic diarrhœa, I should administer to these latter, watchfully and early, the most approved medicines: but what am I to do in cases of unmistakable cholera, where the countenance tells at once, the unknown profound changes within the body, which rapidly end the heart's action?

I feel that in justice to my patient's hope of life, I would do nothing, except in relieving his expressed wants, and supplying whatever his instinct might seek or point to.

The recumbent position, frictions when cramps occurred, gentle warmth, the freest supply of

cold water if asked for, are all I know of treatment. But whatever the patient wished, should be given, and watch made for some gleam, from his instinctive desires, which might give light or analogy toward a true remedy.

I should view the symptoms, which we call cholera, as the sequelæ, the natural course, perhaps, towards natural self-restoration; the result probably of some momentary—it may be infinitesimal—change antecedently happened.

Not that supposing this idea to be true, the use of remedies should be dispensed with, but it is safer to use no drug or substances, than to use them without true method, or established empirical discovery of their value.

Such a hypothetical view, of what we call cholera, may embrace many possible means of production. Cholera may be of the nature of a cycle of change natural, and inherent, and inevitable, in the very composition and nature and relations of the human body, and its whole surroundings and existences, and true parts; it may also be, or not be, infectious, or may partake of both these characters, but may yet more than in the body itself, be the result potentially, of some one or more chief change in external physical influences, as of heat, light, magnetism, &c.

A recognition of the exquisite balance of infinite actions, relations, and parts which matter exhibits (or rather, which are *of matter* and *matter of them*)

in its course of time and “forms” in man, and other living things, and whose rate rather than balance, is not a fixed, but as yet an unexpressed fixed-progressive one, evolving not perfect life or rate, but a present formative series, *e.g.*, childhood with its necessitous passage into the rate of the eruptive fevers, youth with its power and passions, manhood with its passage to tubercle, cancer, &c., old age with its cessation of the vital power of matter, in its then existing combinations, &c.,—opens the view to the vast relations, in extent and time, of man and his deviations; but such are man’s senses, mind, and place in the whole series, that he is, by the simple observation of any fact, made cognisant of the “whole series of antecedent relations,” these being actually parts of such fact. Man seems, indeed, to be the final expression (so far) of all antecedent things; and thus to see and hear, and thus to know, appears to be his happy necessity, and hope, and joy.

Thus, then, however immense may be the field which the human body, in the full view of any of its deviations, such as cholera, may present, and however hopeless may be the attempt to travel this whole field, yet cholera is, in its very existence, one and part of the period and “forms” of all other existences; and hence the almost—nay, actual—certainty of hope of the presence *at hand to us* of the means, mineral elements, or organic matters, lost or wanting, in the evolving rate or stream of

life or death,—in the compounds of matter of which the animal frame is composed.

It is natural at first for the mind to see in cholera, only or mostly, the fatal result and the most apparent symptoms; nor less so, for as to pour in drugs against symptoms, though based on a dark immethodic hope, of some possible remedy for them. For as we do know of some curative agents for some diseases, fair reason for conjectural analogy and hope, arises, of other curative substances for other diseases. Hence in so pressing an emergency, and in such an absence of light and knowledge, a medical man may be perhaps pardoned, or even justified, the administration of any drug or substance.

But does not the wider and juster view, which increased knowledge in this age has given, lead us more fairly, and more in justice to our patients, and more in accordance with a true method, to avoid an interference with symptoms, which are true consequences of the natural effects or directions of Nature's course, toward the return of normal health.

The gleam only of analogy, which has directed the thoughts and practice of so many, who have believed in the value of their own particular treatments of cholera, has not yet been bright enough to pass us to immediate and actual knowledge.

Sad is the fact of the non-efficacy of all these treatments, and yet more sad, the imperfection of

the habit of recognising truth from individual assertion—even now, 250 years since Bacon wrote ! Yet the pouring in of substances, into the human body, as based on the hope of some true remedy, has been, in a wide view, a practice justly yet coarsely, and, as it were, amongst the earliest efforts of human intelligence, in its natural course toward true analogy.

Some of these directions have been apt enough, though unhappily not successful, *e.g.*, that of giving quinine. Should I find in any epidemic of cholera from Bengal, that at any period, the cases showed a nearer appearance to an intermittent course, than cholera usually does, quinine would be the remedy used. The discovery of the curative powers of quinine in certain cases of fever, is a fact second to none, in the keen hopes which it excites toward analogous remedies. The difficulty in perceiving such, and which *must be everywhere open and clear around about us*, arises not so much from the immensity in extent and minuteness of nature, but from man's habits of mental assertion.

Beyond giving quinine, and the general measures before mentioned, I would, in justice to my patients' hope and right of life, omit all the treatments which have been so often, and worse than vainly used.

I cannot but strongly think, that our efforts to cure by treating symptoms, are of a method worthy only of the very earliest capacity of human intelli-

gence. The mind should seek rather to perceive what *want* there may be—what changed relation *in man's composition*, and nature and parts, or relatively to external existences, is the potential parent of the first fact or act, whose natural and necessary consequences, are the series of symptoms we call cholera.

That great force of facts, lead to this view as paramount, may be perceived from many aspects and analogies—amongst others, by the fact of the outbreak occurring when the bodies of the natives are *first* taken out to sea, from their native and accustomed clime and soil, &c. The change here, is from the so-called miasmatic clime of Bengal, to what is called the healthful one of the sea; yet in one ship intermittent fever will prevail, in another bowel complaints, in another low bronchitis, in another cholera, &c.

Such is the natural tendency of these people's systems, that with, perhaps, any change from their accustomed habitat, any loss of their previous prevailing associations, and of which their lives and health are *one part of a whole*, that these deviations or diseases occur. Surely it is no "poison" or "miasma," and surely the apparently greater phenomena or symptoms, are but the ulterior, and, as I have remarked, the curative directions of nature, toward a return to a normal or mostly (and necessitously) prevailing or existing course. For man, and his rates of health and disease, are

of all the universe, both in time and extent, one part and congeries.

Rather than to pour in drugs by dark analogies, we ought to seek to perceive what the actual change in the relation is; what the first potential shivering, or chill, or vital depression is, or what the perhaps single want is, which makes the first act or fact, in the human body, of a cholera, fever, &c., a necessary and natural occurrence.

An attempt to see, from collateral knowledge of physical compositions and agencies, some light; and also a close observation of the greater habits and states of the people, may show the most promising field for hope.

In the absence of knowledge of any specific or means, be it perhaps some simple mineral element, or single organic compound, which given to the native, would restore his system to a state, not liable to pass into the state of cholera, I can only adopt these general means of care and protective treatment, which shall make him feel to the least degree, the lowering influences, of what may be called hypothetically, the "shock," or depression, consequent and inevitable from his first launching into the tonic circumstances of a sea exposure.

Not viewing an outbreak of cholera on ship-board, occurring soon after sailing, as in any way related to any "poison" or "thing," I should seek to give the feeble Coolie's system rest, quiet, warmth, and sufficient ventilation, carefully avoid-

ing excessive currents of atmosphere, and should act on the same general principles, which would be just, in guarding against his system's passage into any other somewhat varied deviations, as fever, dysentery, bronchitis, &c.

This view of management is equally just, whether the native's tendency to cholera be found to be mostly from changed external relations of atmosphere, &c., or from internal changes, the result of some elementary want in composition; or from both.

The most prominent thought which arises, from contemplating such a phenomenon as an outburst of cholera, coincident with, or soon after, sailing is, that the native's system, is so tenderly balanced in or with the continuance of vital action, that small increments of change in its external relations, and consequently in its own states, are the natural courses of this disease.

It seems a most important fact to be remembered and dwelt on, that such a change in man, as cholera, is sometimes the necessitous result of such small alterations in the accustomed surroundings and existences of the human body, as happens to it, when transported from his natural and accustomed home to the sea. Whilst it may be a reasonable enough conjecture, when this disease occurs on shore, to attribute it, at times, to some "poison" or local thing, or malaria, &c.; yet on its occurrence at sea, and especially on the *first exposure*

to the "strong" sea air, we cannot lend to this hypothesis, but rather (whatever this may mean and contain of changed physico-vital relations external to, and in man) to the natural and necessitous course of his system, such as it now is, in its composition, removed from the entirety of his accustomed and, to him thus natural, physical associations; in other words, to a change or loss or depression of his system, allowing the natural passage, from the normal rate of health, into other rates, viz., cholera, rheumatism, bronchitis, sore-throat, diarrhœa, &c.

While, therefore, one seems justified in holding that a protective treatment is that which is paramount, and strongly opposed to that other management, often recommended—viz., a severe and rigorous exposure to a continuously and rapidly changing atmosphere, as though dreading some poison, which could be blown away, one yet longs for the perception of some instinct on the part of the people, or some apt and true analogy; some probably single material substance, which should act and retain the balance of the vital powers. Nor are such speculations remote, or without method of true analogy of hope for cure.

We have ceased to view the frightful picture of the symptoms, as the true disease, but as the ulterior and even curative course of the system. And when we view the amazing complexity of the combinations of matter, of structure, and function in

a living animal, and also the infinite ages of time, in which matter, &c., have become present man, and also the errors of life and habit of man through so many ages, we cannot be surprised that some individuals, and even races, should show, too early in their age, powerful deviations of course and tendency to death, the results of imperfect material composition of the animal body.

Such phenomena as cholera, fevers, bronchitis, pneumonia; also tubercle, cancer, goître, &c., become to our view, in a most important sense, not to be considered as “diseases,” but as natural and contained and necessary events, in the natural history of the human system and race.

Hence arises the ardent hope of the supply, of so small, yet all-essential wants. But until we have recognised what that remedy is, which shall render cholera impossible, is it not better to confess our ignorance, than to be heaping up the records of worthless treatments, thus disfiguring the fair fame of science, after having already sufficiently inflicted our patients?

THE END.



